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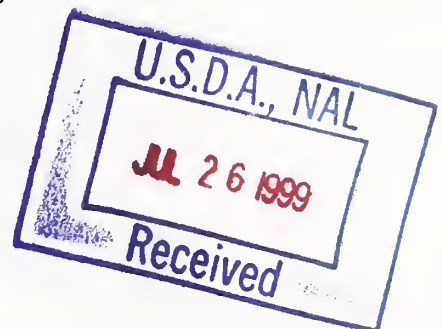
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FOREST HABITAT for REPTILES & AMPHIBIANS of the NORTHEAST

by

Richard M. DeGraaf
Principal Research Wildlife Biologist
Northeastern Forest Experiment Station
Amherst, Massachusetts

Deborah D. Rudis
Wildlife Technician
Northeastern Forest Experiment Station
Amherst, Massachusetts



Northeastern Forest Experiment Station

and
Eastern Region

FOREST SERVICE
U.S. DEPARTMENT OF AGRICULTURE





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There are many others who helped with this manual by providing information and offering their expertise and encouragement. We would like to thank them for their contributions to the content of this manual, but space limits us from naming them all.

Special thanks to Dottie McDougal and Freddie Morrill for patiently typing several drafts of the manuscript. Illustrations were done by Barbara Terkanian of Concord, Massachusetts.

This management guide is the first such undertaking for the herpetofauna of the northeastern United States. This data base can be improved when new information is discovered. Some details provided in this manual may be reevaluated. Any comments or questions should be addressed to the authors at:

USDA - Forest Service
Northeastern Forest Experiment Station
Hilton House
University of Massachusetts
Amherst, MA 01003

FOREWORD

Approximately 75 species and subspecies of amphibians and reptiles occur in the eight-state New England Planning Area of the Eastern Region, Forest Service, U.S. Department of Agriculture. Some species are widely distributed and well-known, but the occurrence and even the life histories of many others are very poorly known.

The Forest Service is committed to the maintenance of natural communities. Amphibians and reptiles comprise a rich biological resource, and consideration of their habitat requirements is essential to a sound land management program.

This publication provides the most comprehensive information available on the natural histories and habitat associations of amphibians and reptiles within forest environments of the Northeast. The information will help Federal and State land management agencies, as well as private organizations, plan for the habitat needs of these important species in the management of public and private forest lands.

A handwritten signature in cursive script, reading "Steve Yurich", written over a horizontal line.

STEVE YURICH
Regional Forester
Eastern Region, Forest Service
U.S. Department of Agriculture

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Rivers and streams provide essential habitat for amphibian species such as the Northern dusky, Northern spring, and Northern two-lined salamanders. Reptiles which also utilize these riparian habitats are the Eastern milk snake, wood turtle, and Eastern garter snake.

INTRODUCTION

The habitat associations of amphibians and reptiles are generally not as well known as those of birds and mammals. Indeed, we know little about the life history, status, and distribution of many species. Amphibians and reptiles are important components in the functioning of forest and other ecosystems, but they are often omitted from wildlife management plans because their habitat needs, and even their presence, are so poorly described. Some species may be quite abundant, yet are rarely encountered due to their fossorial habits, nocturnal activities, or limited movements.

The size, distribution, and variety of wildlife populations are functions of the amount, diversity and quality of available habitats, among other factors. Sound wildlife management is, therefore, dependent upon the systematic accumulation and analysis of habitat data.

Our purpose here is to assemble natural history profiles of these species and their associations with forest types and age classes. These associations, presented for both timbered and non-timbered communities, will enable forest managers or wildlife biologists to describe the general herpetofauna to be found in a given forest community or age class. The natural history profiles provide additional detailed habitat or life history information.

Management of wildlife on public lands is a responsibility shared by the various states and federal land management agencies. By agreement, states manage or regulate wildlife populations and federal agencies

manage habitats. Naturally, close cooperation is required to meet wildlife management goals. This manual provides only habitat information--wildlife population goals must be developed through the coordination or activities of all involved agencies.

Recent legislation has mandated that ecological considerations have an important role in forest management and related resource-use decisions and includes:

1. Fish and Wildlife Coordination Act (16 U.S.C. 661-666c, 1934 as amended). It seeks to protect fish and wildlife habitats by requiring the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to review and report on proposed water and associated land development projects. Evaluations cover projects receiving Federal funds and those permitted under Sections 9 and 10 of the River and Harbor Act of 1899, Sections 402 and 404 of the Federal Water Pollution Control Act amendments of 1972, and other appropriate Acts.
2. Multiple Use and Sustained Yield Act of 1960 (P.L. 86-517). It directs the U.S. Forest Service to consider all renewable resources in conjunction with one another.
3. National Environmental Policy Act of 1969 (P.L. 91-190). It encourages productive harmony among man and his environment. It requires any Federally financed project be evaluated and environmental impacts, including those on fish and wildlife, and alternative opportunities be identified.
4. Endangered Species Act of 1973 (P.L. 93-205). It calls for conservation of endangered and threatened species, and of the ecosystems supporting them. Critical habitats, required to assure survival and restoration of endangered species are identified, delineated, and maintained.
5. Sikes Act of 1974 (P.L. 93-452). It calls for new directions and cooperation with the states in planning and management of wildlife habitat on Federal lands.
6. Forest and Rangeland Renewable Resources Planning Act of 1974 (P.L. 93-378). It directs the U.S. Forest Service to inventory natural resources in the National Forest System and provide comprehensive plans for their management.

7. Federal Land Policy and Management Act of 1976 (P.L. 94-579). It established national policy to retain rather than dispose of the National Resource Lands, and directs that those lands be inventoried, uses be planned on a multiple-use and sustained-yield basis, and that lands be managed on a sound ecological basis, with habitat provided for fish and wildlife. Land-use plans and regulations must include protection of public land areas of critical environmental concern. This means delineated areas of public lands where special management attention is required, among a broad spectrum of purposes, to protect and prevent irreparable damage to important fish and wildlife resources or other natural systems or processes. In resource inventories, priority shall be given to designation and protection of areas of critical environmental concern.
8. National Forest Management Act of 1976 (P.L. 94-588). It requires, among other things, that research be conducted to ensure that land management systems will not substantially impair land productivity.

Most forest wildlife habitat management efforts are results or consequences of forest management practices. Thus wildlife habitat associations need to be expressed in terms of forest management. Through knowledge of the habitat requirements of wildlife species and species groups, the biologist can prescribe habitat treatments to satisfy wildlife needs. Habitat management can be planned for wildlife communities or for enhancement of specific species, such as endangered species.

Managers of public lands are responsible for determining the effects of management activities upon all wildlife, including amphibians and reptiles. Without a fairly complete knowledge of the natural history and habitat associations of amphibians and reptiles, management programs that consider these species cannot be properly developed. In order to predict the effects of land management practices on a species or species group, the habitat requirements of each must be understood.

Because many amphibians and reptiles have small home ranges and seldom move far from their natural habitats, silvicultural practices that alter community types can eliminate local populations. Where endangered or threatened species or isolated populations occur, management practices need to be carefully reviewed for their possible impacts. With increasing demands for timber production and recreational uses of public forest lands, wildlife habitat requirements must be defined and analyzed in each community type for true multiple-use planning.

SPECIES ACCOUNTS

This manual presents to the forester and biologist information on the natural history of amphibians and reptiles that occur in the Northeast, although this information has wider geographic applications. We assembled this information from the available literature, expert reviews, and continuing field research. Natural history profiles and tables describe each species' occurrence in the major forest (community) types and age classes (successional stages) of the Northeast.

Information for the life history accounts is taken from studies conducted in the Northeast when such references were available. Where information from states outside the region is included, the locality of the research is noted in the text.

The relative abundance indicated in each species account is an approximation; for more specific information, the status tables should be consulted. Included in the habitat section are details from

knowledgeable local herpetologists. Habitat use during breeding and hibernation periods is summarized in this section, and, if specific habitat components are required by a species, they are listed under Special Habitat Requirements. The Comments section provides an assortment of additional information to better acquaint the user with each species.

Often life history information is unavailable; further research is needed to fill existing gaps. Key life history references are listed at the end of each species account. They are not necessarily the most recent references, but are included because they are the most complete general references available.

SPECIES INCLUDED

The 75 amphibians and reptiles in this guide were selected because all or part of their ranges fall within the New England Planning Area of the Eastern Region, USDA Forest Service (Fig. 1). Introduced species that have established populations in parts of the region have also been included.

Although the guide is limited to amphibians and reptiles of the eight-state New England Planning Area, the natural history profiles and range maps include information on these species in thirteen northeastern states. This was done to make the guide useful to biologists and foresters in states where most of these forest (community) types and species are also found.

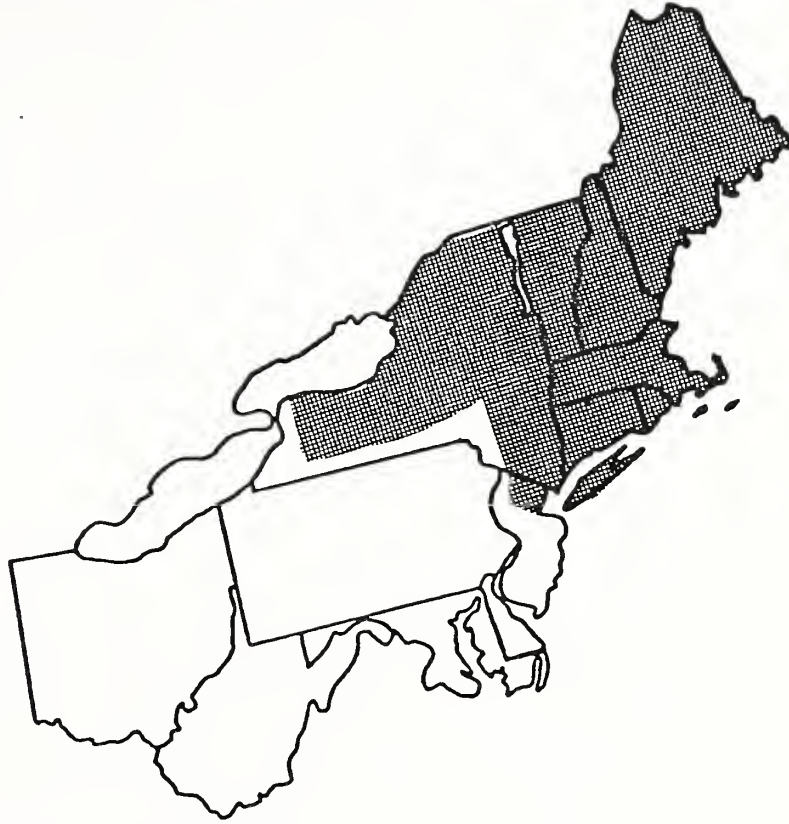


Figure 1. Map of the New England Planning Area, Eastern Region,
USDA Forest Service.

The scientific names follow those used in Collins et al. (1978):
Standard Common and Current Scientific Names for North American
Amphibians and Reptiles, except for the greater and lesser treefrogs
(*Hyla v. versicolor*, *H. v. chrysoscelis*) which are considered separate
subspecies in accordance with Fellers' (1979) paper addressing this
distinction.

DISTRIBUTION MAPS

A map of each species' approximate distribution in the Northeast is included with its natural history profile. The map shows the extent of the continuous range, but because the maps were derived from the literature and not from museum or voucher specimens, the continuous range may include areas where a species has not been found but is presumed to occur. Some subspecies may show geographic overlap but will not occupy the same habitat within the same range.

SPECIES/HABITAT TABLES

Summaries of species' associations with community types are presented in tabular form. The amphibians and reptiles of timbered and non-timbered community types are presented separately. Species occurrence is listed for the White and Green Mountain National Forests, the two Forests for which this guide was originally developed. To make this manual useful to other agencies, organizations, or individuals, the local occurrence column is left blank--it can be checked as a reference for species' occurrence in other localities. Also, blank lines are provided for the inclusion of additional species.

The forest community types in the New England Area are presented with age groups as they exist under even age management (Table 1). Only in Northern Hardwoods-Hemlock is an all-age group shown. These community types are the basic forest classification units upon which this guide is based. This particular scheme is used in National Forest planning and is described in the U.S. Forest Service Compartment

Prescription Handbook (USDA 1981). The relationships between this classification scheme and other plant classification systems are presented in Figure 2.

Since most northeastern amphibians require water for breeding, there may be no direct relationship between their occurrence and forest type or age class on their breeding territories. Indirect relationships may occur when vegetative cover in riparian zones affects water temperature, pH, or the presence and type of bottom litter. Some species may be found in a wide range of forest community types if the required aquatic habitat component is present within those types. Some terrestrial microhabitats of forest communities may be equally important in determining species occurrence (Krysik 1980). Pollutants may impose a further limitation on occurrence of some species (Gochfeld 1975). The life history accounts in this manual, used in conjunction with the tables, will provide this cautionary information. Further research in the field is necessary for determining more specific habitat relationships of amphibians and reptiles.

Definitions of the terminology used in the tables are found in the following section. Non-timbered type definitions are taken from the Forest Service Compartment Prescription Handbook (USDA 1981).

COMMUNITY TYPES

The forest community types in the New England Area are presented below with age groups as they exist under even age management. Only in Northern Hardwoods-Hemlock is an all-age group shown. These community types are the basic forest classification units upon which this guide is based.

Table 1. AGE GROUPS OF TIMBERED COMMUNITY TYPES -
NEW ENGLAND AREA.

<u>Community Type</u> ^{1/}	<u>Age Classes</u> ^{2/}	<u>Age (yrs.)</u>	<u>Timber Species or Groups Included</u>
Aspen	R	0-9	Quaking aspen
	Y	10-39	Big-tooth aspen
	M	40-59	Aspen-fir
	O	60+	
Birch	R	0-9	Paper birch
	Y	10-49	
	M	50-79	
	O	80+	
Northern Hardwood-Hemlock	R	0-9	Sugar maple-beech-
	Y	10-59	yellow birch
	M	60-119	Red maple (dry)
	O	120+	Sugar maple
	A	all-aged	Beech
Swamp Hardwoods	R	0-9	Black ash-American
	Y	10-59	elm-red maple
	M	60-119	Red maple (wet)
	O	120+	

AGE GROUPS OF TIMBERED COMMUNITY TYPES - NEW ENGLAND AREA (cont'd.)

<u>Community Type</u> ^{1/}	<u>Age Classes</u> ^{2/}	<u>Age (yrs.)</u>	<u>Timber Species or Groups Included</u>
Northern Red Oak	R	0-9	Northern red oak
	Y	10-59	
	M	60-99	
	O	100+	
Oak-Pine	R	0-9	Other oak-pine White pine-red oak- ash
	Y	10-59	
	M	60-99	
	O	100+	
Balsam Fir	R	0-9	Balsam-aspen- paper birch
	Y	10-39	
	M	40-69	
	O	70+	
Pine	R	0-9	Red pine White pine White pine-hemlock
	Y	10-69	
	M	70-119	
	O	120+	
Spruce-fir	R	0-9	Red spruce-balsam fir Northern white cedar Mixed swamp conifer Cedar-aspen-paper birch
	Y	10-39	
	M	40-89	
	O	90+	
Spruce	R	0-9	Red spruce
	Y	10-39	
	M	40-99	
	O	100+	
Hemlock	R	0-9	Hemlock
	Y	10-69	
	M	70-119	
	O	120+	

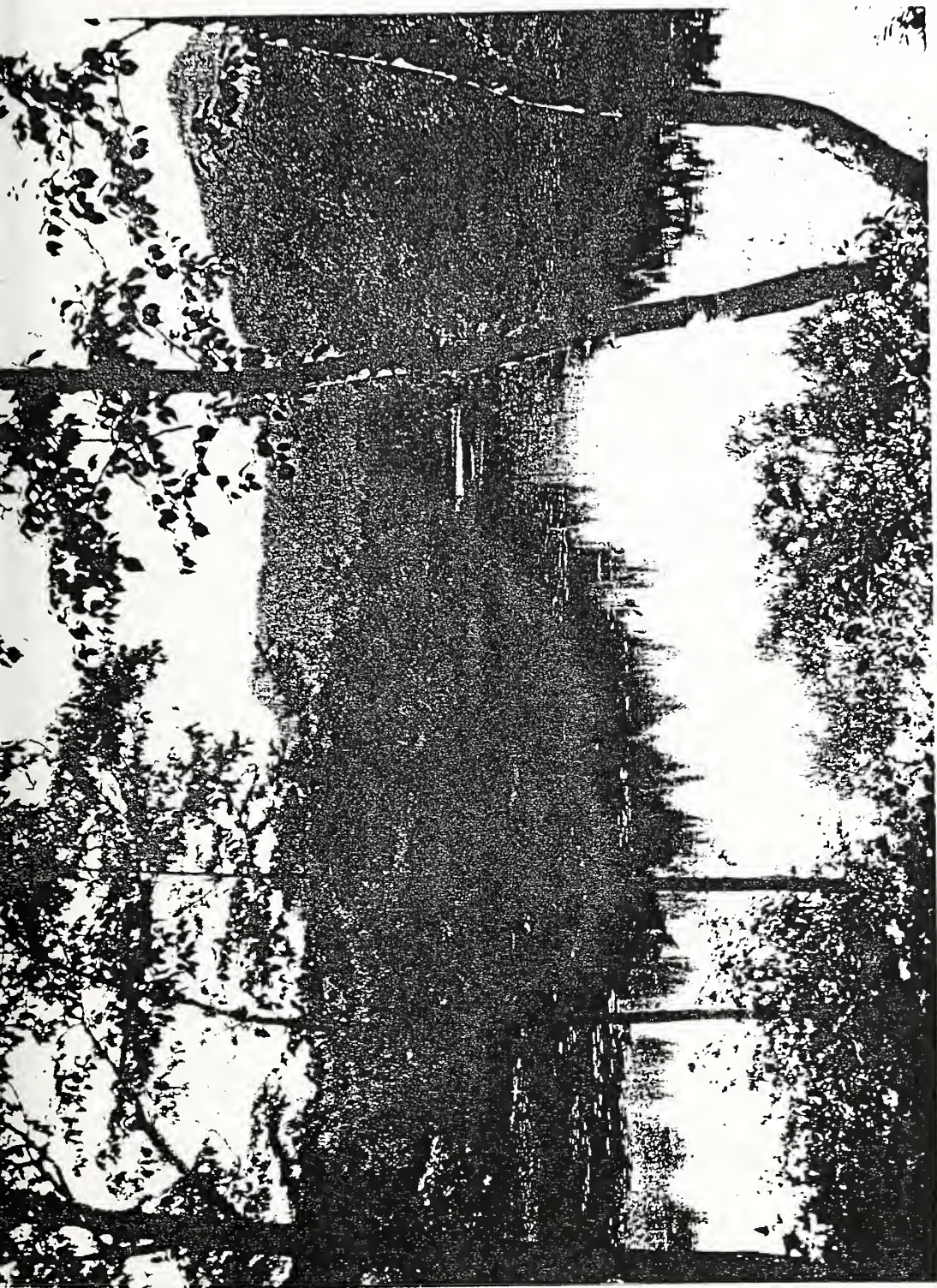
^{1/} Forest types such as pitch pine, oak-hickory and tulip poplar occur in New England, but are not typically major components of New England forests.

^{2/} R - Regenerating
S - Seedling/sapling
Y - Young, poles
M - Mature
O - Old growth, pathological rotation age
A - All-aged

Relationships between U.S. Forest Service Timbered Community Types and other plant classification systems used in the Northeast.				
Society of American Foresters - Cover Types & Numbers ¹	U.S. Forest Service - Timbered Community Types - New England Area ²	Potential Natural Vegetation of the U.S. (Küchler 1964) ³	Ecoregions of the U.S. (Bailey 1978) ⁴	
Red Spruce-Balsam Fir 33 Northern White Cedar 37	Spruce-Fir	Conifer Bog K-94	Northern Hardwoods-Spruce 2114	
Red Spruce 32	Spruce	Northeastern Spruce-Fir Forest K-96		
Balsam Fir 5	Balsam Fir		Northern Hardwoods 2113	
Aspen 16	Aspen			
Paper Birch 18	Birch			
Hemlock 23	Hemlock	Transition between Northern Hardwoods and Appalachian Oak K-109 (K-104 & 106)		
Sugar Maple-Beech-Yellow Birch 25 Gray Birch-Red Maple 19 Sugar Maple 27	Northern Hardwood-Hemlock	Northern Hardwoods-- Spruce Forest K-108	Appalachian Oak 2214	
Red Pine 15 White Pine 21 White Pine-Hemlock 22	Pine	Northern Hardwoods K-106		
Northern Red Oak 55	Northern Red Oak		Appalachian Oak 2214	
White Pine-Red Oak-Ash 20 Bear Oak 43 Chestnut Oak 44 Pitch Pine 45	Oak-Pine	Appalachian Oak K-104		
Black Ash-American Elm- Red Maple 39	Swamp Hardwoods	Northeastern Oak-Pine Forest/K-110		
		No provision in Küchler (1964).	No provision in Bailey (1978).	

¹Society of American Foresters. 1967. Forest cover types of North America. Soc. Amer. Foresters, Washington, D. C. 67 p.
²On file at USDA Forest Service, White Mountain National Forest, Laconia, N. H. 03246.
³Küchler, A. W. 1964. Potential natural vegetation of the conterminous United States (manual and map). Amer. Geographical Soc. Spec. Pub. No. 36.
⁴Bailey, R. G. 1978. Descriptions of the ecoregions of the United States. USDA Forest Service, Ogden, Utah. 78 p.

Figure 2. Relationships between plant community classifications used in the Northeast.



Residents of lakes and ponds in northeastern forests include the spotted turtle, Northern water snake, red-spotted newt, bullfrog and greenfrog. Other species, such as the wood frog, Northern spring peeper and spotted salamander require these wetlands for reproduction but may not be found in them at other times of the year.

Home Range - The area traversed by any individual animal during its normal life. Individuals, pairs, or family groups of animals commonly restrict their activities to a definite home range.

Krummholz Zone - The transition zone from subalpine forest to alpine tundra characterized by dwarfed, deformed, wind-sheared trees.

Mature Stands - Areas covered by trees of small sawtimber size--larger than 9 in (22.9 cm) dbh if conifers, and 11 in (27.9 cm) dbh if hardwoods. Competition between trees has eliminated some overtopped or diseased individuals. Shade tolerant species such as beech, hemlock, and sugar maple are common in such stands. Very few large trees (14 in, 35.6 cm, or more dbh) or snags are present in such stands, and dense shade prevents understory development, although some understory plants exist.

Nonvegetative, Rock, Sand, Mud, etc. - Land components which do not conform to the definitions for other non-timbered community types. Generally has a geologic origin, but may include man-made habitats such as gravel pits, quarries, buildings, human debris, and other structures.

Old Growth - Areas covered by trees which are on the average larger than 14 in (35 cm) dbh with diseased and damaged trees becoming noticeable as they approach pathological (natural) rotation. Snags for cavity nesters become apparent; mortality and windfall create small clearings that soon become pockets of regenerating growth.

Opening - Land on which grasses, herbs, and shrubs dominate the vegetation, including but not limited to "nonforest" and "unproductive forest." Openings may include some trees.

Opening-Undifferentiated - A land area having high solar illumination at the ground level. An opening can be dominated by land features such as water or rock or by vegetation features such as grasses, forbs, or shrubs.

Orchard - Areas one-half acre (0.2 ha) or larger where fruit trees--usually apple--are abundant. Groups of trees can be classified as "orchard" if they occur in clumps of five or more trees or where there are more than 10 trees per acre (0.4 ha). At this tree density, the fruits produced constitute a significant food source for many wildlife species.

Pasture - Grazing land under relatively intensive management, usually supporting introduced forage species, and receiving periodic cultural treatment such as tillage, fertilization, mowing, and irrigation.

Regenerating Stands - Areas in the process of being restocked with trees by natural means or by planting. Trees are of seedling and small sapling size--up to 5 in (12.5 cm) dbh. Tree species present are very tolerant of shade such as aspen, cherry, paper birch, and sometimes pine. Stands in this size group are important in producing grasses, forbs, and shrubby growth in abundance for ground-nesting and feeding birds.

Relative Abundance - abundant - very plentiful
common - readily found to be present
uncommon - not readily found, but present
rare - present in such low numbers that a finding is considered noteworthy.

Riparian - The banks and adjacent areas of water bodies, water courses, seeps, and springs whose water provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a more moist habitat than that of contiguous floodplains and uplands.

Savanna - Land areas dominated by grasses and sedges, with open stands of widely spaced trees. A savanna results from either soil-moisture regimes or disturbances such as fire or grazing.

Shrub - A plant that has persistent, woody stems and a relatively low growth habit, and generally produces several basal shoots instead of a single bole.

Vegetation - Submergent - Plants which grow below the water surface. Flowering parts of some species may be above the water surface.

Emergent - Vegetation with submerged roots and leafy parts above the water surface. Herbs growing out of water, but on saturated soils are included in this definition.

Surface - Floating plants with most of plant occurring on the water surface.

Wildlife Habitat - The plant where animals live. Also refers to the plant communities upon which they are dependent for their livelihood.

Young Stands - Areas in the process of becoming dominated by tree species rather than by shrubs, forbs, or grasses. Tree stems are of sapling size, averaging 5 to 9 in (12.5 to 23 cm) dbh in softwoods and 5 to 11 in (12.5 to 27.5 cm) dbh in hardwoods. More tolerant species such as red maple and yellow birch, are commonly found in young stands.

AMPHIBIAN AND REPTILE STATUS RATINGS

There are presently 47 species of amphibians and reptiles occurring within the eight states of the Northeast region that have special status. Their inclusion on a rare and endangered species list was developed by State and Federal agencies or special study groups. Species listings are provided on a state-by-state basis, therefore, the status designation in one state may differ from the status of the species in an adjacent state (Tables 2 and 3). Species status accompanied by protective legislation is denoted by an asterisk.

The information provided in Tables 2 and 3 is current as of April 1981. The list has been supplemented with additional state data obtained from revision work currently in progress since the original publication date. Spaces are provided at the end of each table for the inclusion of additional species as needed.

Terms in the lists and abbreviations found in Tables 2 and 3 are defined as follows:

Society for the Study of Amphibians and Reptiles (SSAR)

Ashton, Ray E.

1976. Endangered and threatened amphibians and reptiles in the United States. Soc. Study Amphib. Rept., Misc. Publ., Herpetol. Circ. 5. 65pp.

Taxa are classified with respect to their status in each state. The state abbreviation follows the classification on the table.

E (Endangered) - A taxon that has become reduced in numbers throughout its range (or had its habitat reduced) to such a point that reproductive populations are extremely small or vulnerable to extirpation.

T (Threatened) - A taxon that is represented in only a limited part of what was once its total range, with reduced populations due to habitat destruction or poor State or Federal management.

R (Rare) - Those species or subspecies that are considered rare throughout the state or are found in environmental conditions disjunct from the normal geographic range of the species.

P (Peripheral) - Those species or subspecies that reach the edge of their range in a state.

U.S. Department of the Interior, Fish and Wildlife Service.
1980. Endangered and threatened wildlife and plants--
republication of list of species. Federal Register 45(99):
33768-33781.

E (Endangered) - Those species in danger of extirpation throughout all or a significant portion of their range.

T (Threatened) - Those species likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

The eight states included on this list have agreed to protect all species that are Federally listed. Further protection for amphibians and reptiles has been legislated in Massachusetts, New Jersey, New York, and Rhode Island at this writing. Maine, New Hampshire, and Connecticut have developed lists of the less common species but have not provided legal status as yet.

MAINE

Species unofficially listed for future consideration:

Center for Natural Areas.

1976. Reptiles and amphibians. Pages 260-265 In
A preliminary listing of noteworthy and natural features
in Maine. A report prepared for the Critical Areas
Program.

R (Rare) - Species listed by relative scarcity scale
of 1 to 4.

1 = common

4 = rare

SL (State Local) - Long-established breeding or
wintering species in the Commonwealth that are
restricted to very limited areas. A few species
(SLA) which are widespread but nowhere frequent,
are also included.

CONNECTICUT

Species unofficially listed for future consideration:

Dowhan, J. J., and R. J. Craig.

1976. Rare and endangered species of Connecticut and
their habitats. State Geological and Natural History
Survey of Connecticut. Rep. of Investigations No. 6.
137pp.

E (State Endangered Taxon) - In danger of extinction
in Connecticut as a reproducing taxon; rare or very
local throughout all or much of its range, or having
a relatively restricted geographic range.

D (State Declining Taxon) - A threatened taxon, whose
populations are currently undergoing a prolonged,
noncyclic decline in Connecticut and in many other
parts of its range, and is either approaching
rarity or is already very rare in the State. These
taxa are likely to become endangered within the near
future in the State.

MASSACHUSETTS

Certain species are legally protected:

Code of Massachusetts Regulations, 321 CMR part 3.05 authorizes the Division of Fish and Wildlife to promulgate regulations of Massachusetts General Laws Chapter 131, Section 5. (April 1980).

P - Protected.

S - Season set for hunting or taking species.

Listed species with no legal status obtained from revision of publication (in progress):

Massachusetts Division of Fisheries and Wildlife.
1978. Species for special consideration in Massachusetts.
Publ. No. 11094-5-100-12-78-CR.

E (Endangered) - Any species which is in danger of extinction through all or a significant portion of its range.

SR (State Rare) - Long-established breeding or wintering species quantitatively documented to be declining, facing extirpation from the Commonwealth, and considered likely to disappear without special action.

SL (State Local) - Long-established breeding or wintering species in the Commonwealth that are restricted to very limited areas. A few species (SLA), which are widespread but nowhere frequent are also included.

RHODE ISLAND

Legal protection of amphibian and reptile species is afforded by:

Rhode Island Department of Environmental Management, Division of Fish and Wildlife. Rhode Island Wildlife Laws.

P (Protected) - Protected under State wildlife laws, special rules and regulations, provision in Section 21-9 of the General Laws of the State of Rhode Island.

Rhode Island National Heritage Program of 1980 developed a list of the species for consideration as an unofficial list including species to be considered in planning:

S - Species for consideration.

I - Introduced species.

A - Species probably present in Rhode Island but no verified records.

SE - State endangered.

NEW YORK

Certain species are legally protected:

New York State Department of Environmental Conservation.
1970. Traffic in endangered species of fish and wildlife.
Section 182.1.

E (State Endangered) - Species threatened with extinction as listed in the Federal Register.

New York Environmental Conservation Law, Section 11-0103(c).

P (Protected) - As small game with a closed season.

Endangered Species Unit listing of species with unofficial classification.

SC (Special Concern) - Species probable candidates for inclusion on official state listing, or species not yet endangered or threatened which should be monitored.

Landry, J. L., L. P. Hirsch, and E. R. McCaffrey.
1979. A rating system for threatened and endangered
species of wildlife. N.Y. Fish and Game Journal
26(1):11-21.

T (Threatened) - Species whose populations in New York
are subject to a significant threat from known or
unknown causes, but which face little danger of
extirpation within the foreseeable future if certain
actions are taken and maintained.

NEW JERSEY

All species listed are protected under New Jersey Wildlife Law
23:1A-6, 1973.

New Jersey Department of Environmental Protection, Division of
Fish, Game and Shellfisheries.

1979. Endangered, threatened, peripheral, declining,
undetermined and extirpated wildlife species in New Jersey,
official list. Endangered and Nongame Species Project.
Trenton. 12pp.

E (Endangered) - An endangered species is one whose
prospects for survival within the State are in
immediate danger due to one or many factors--a
loss of or change in habitat, over exploitation,
predation, competition, disease. An endangered
species requires immediate assistance or extinction
will probably follow.

T (Threatened) - May become endangered if conditions
surrounding the species begin to or continue to
deteriorate.

U (Undetermined) - A species about which there is not
enough information available to determine the status.

D (Declining) - A species which has exhibited a continued
decline in population numbers over the years.

R (State Rare Taxon) - Populations and/or individuals occurring in very low numbers relative to other similar taxa in the State, although common or regularly occurring throughout much of their ranges. They may be found in a restricted geographic region or occur sparsely over a wider area. Although rare, populations are apparently stable. Also included in this category are migrant or wintering birds that regularly occur in Connecticut, although are rare throughout all or much of their range.

I (Taxon of Indeterminate Status) - One whose population status within the State is unclear or unknown at this time; further investigation and additional information is necessary. This category includes those taxa that have not been collected or observed in a great many years and which may now be extinct in the State.

NEW HAMPSHIRE

Species unofficially listed for future consideration:

New Hampshire Fish and Game Department.

1980. New Hampshire endangered and threatened species list.
1p.

Species of Concern:

R - Rare

U - Status Undetermined

VERMONT

No list of endangered herpetofauna developed to date.

TABLE 2. AMPHIBIANS WITH SPECIAL STATE STATUS IN THE NORTHEAST.

AMPHIBIAN SPECIES	SSAR	STATE LISTS								FEDERAL LIST	
		ME	NH	VT	MA	CT	RI	NY	NJ		
MUDPUPPY			R			I	I				
MARBLED SALAMANDER			U		SR, P*		S	SC	D*		
JEFFERSON SALAMANDER	NY(E)		R		SL, P*		A	SC	U*		
TREMBLAY'S SALAMANDER									E*		
BLUE-SPOTTED SALAMANDER	NJ(T)				SR, P*		A	SC	E*		
SPOTTED SALAMANDER	NY(T)				SLA, P*		S	SC, T	D*		
EASTERN TIGER SALAMANDER	NJ(R)							SC, T	E*		
MT. DUSKY SALAMANDER	NJ(R)		R			R			U*		
SLIMY SALAMANDER			R			R					
FOUR-TOED SALAMANDER	NY(E)	R 4	R		SLA, P*	I	S		D*		
NORTHERN SPRING SALAMANDER	NJ(T)	R 3	R		SLA, P*	R	A		D*		
NORTHERN RED SALAMANDER									D*		
LONGTAIL SALAMANDER									T*		
EASTERN SPADEFOOT	CT(R)				P*	R	S		D*		
NORTHERN CRICKET FROG								SC, T	U*		
GR./LESSER GREY TREEFROG									E*		
UPLAND CHORUS FROG									U*		
BULLFROG					S*						
NORTHERN LEOPARD FROG					P*						

*Species status accompanied by protective legislation.

REPTILE SPECIES	SSAR	STATE LISTS							FEDERAL LIST	
		ME	NH	VT	MA	CT	RI	NY		
STINKPOT		R 4								
EASTERN MUD TURTLE						I				
SPOTTED TURTLE		R 4			SL, P*				U*	
BOG TURTLE	CT(E), RI(E), NJ(E)				SR, P*	T	A, P*	E*	E*	E*
WOOD TURTLE		R 4	U		SL, P*		S, P*	P*	T*	
EASTERN BOX TURTLE		R 4	R		SLA, P*		P*	P*		
N. DIAMONDBACK TERRAPIN	RI(T)				SL, P*		SE, P*			
MAP TURTLE									U*	
REDBELLY TURTLE									U*	
PLYMOUTH REDBELLY TURTLE	MA(R)				E, P*					E*
MIDLAND PAINTED TURTLE									U*	
BLANDING'S TURTLE	ME(R), NH(R), MA(R)	R 4	R		SL, P*	I	A	SC, T		
FIVE-LINED SKINK	NJ (P)					R	A		U*	
QUEEN SNAKE									U*	
NORTHERN BROWN SNAKE		R 3								
NORTHERN REDBELLY SNAKE						R	S			
EASTERN RIBBON SNAKE							S			
EASTERN EARTH SNAKE	NJ (R)				P*		S		U*	
EASTERN HOGNOSE SNAKE									D*	
NORTHERN RINGNECK SNAKE		R 3								
EASTERN WORM SNAKE					SL, P*		S		U*	
NORTHERN BLACK RACER		R 4							U*	
EASTERN SMOOTH GREEN SNAKE						D	S		U*	
BLACK RAT SNAKE			R		P*		S		U*	
EASTERN MILK SNAKE		R 3								
NORTHERN COPPERHEAD					SR, P*		A	SC	U*	
EASTERN MASSASAUGA	NY (T)							SC, T		T*
TIMBER RATTLESNAKE	CT(R), RI(E), NJ(R)		U		SR, P*	D	SE, P*	SC, T	E*	

*Species status accompanied by protective legislation.

AMPHIBIAN AND REPTILE HABITAT RELATIONSHIPS

Tables 4 and 5 present habitat associations for amphibians and reptiles whose ranges occur in the New England Planning Area. Associations are shown for timbered communities and age classes and for nontimbered communities, especially wetland types. Most species in particular the amphibians, are more strongly associated with wetland types or other microhabitats than they are with the surrounding forest community type.

However, because forest management practices are usually prescribed by timber type, these associations with forest communities are potentially very important. This is the first attempt to describe herpetofaunal habitats in this way, and the habitat association must therefore be regarded as preliminary. As research progresses, this information can be refined.

The following tables summarize the uses of timbered and nontimbered habitat for feeding and reproduction, and indicate primary habitat and special habitat needs.

Note that the tabular information should be used in conjunction with the habitat descriptions provided in the species accounts, especially where special habitat requirements are noted.

AMPHIBIANS

ASPEN - Regenerating

ASPEN - Young

Redback Salamander
Jefferson Salamander
Wood Frog

ASPEN - Mature

Jefferson Salamander

REPTILES

N. Ringneck Snake
N. Black Racer
E. Milk Snake
E. Box Turtle
Wood Turtle
Bog Turtle

Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
N. Redbelly Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer
E. Smooth Green Snake
E. Milk Snake
E. Massasauga
N. Brown Snake

Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
N. Brown Snake
N. Redbelly Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer
E. Smooth Green Snake
E. Milk Snake
E. Massasauga

AMPHIBIANS

ASPEN - Old

Jefferson Salamander

BIRCH - Regenerating

Bullfrog
Green Frog

BIRCH - Young

Jefferson Salamander
Bullfrog
Green Frog

BIRCH - Mature

Jefferson Salamander
Redback Salamander
Bullfrog
Green Frog

REPTILES

Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
N. Brown Snake
N. Redbelly Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer
E. Smooth Green Snake
E. Milk Snake
E. Massasauga

Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Ringneck Snake
N. Black Racer

Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Brown Snake
E. Garter Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer

Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink

AMPHIBIANS

REPTILES

BIRCH - Mature (cont.)

N. Brown Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer
E. Smooth Green Snake

BIRCH - Old

Jefferson Salamander
Bullfrog
Green Frog

Bog Turtle
Wood Turtle
Box Turtle
Five-lined Skink
N. Brown Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer
E. Smooth Green Snake

NORTHERN HARDWOOD-HEMLOCK - Regenerating

Spotted Salamander
E. Tiger Salamander
Red-spotted Newt
Mountain Dusky Salamander
Four-toed Salamander
N. Two-lined Salamander
Bullfrog
Green Frog
Pickerel Frog

Wood Turtle
Box Turtle
Five-lined Skink
N. Coal Skink
E. Garter Snake
N. Ringneck Snake
N. Black Racer
E. Smooth Green Snake
E. Milk Snake

NORTHERN HARDWOOD-HEMLOCK - Young

Jefferson Salamander
Tremblay's Salamander
Blue-spotted Salamander
Spotted Salamander
E. Tiger Salamander
Red-spotted Newt
Mountain Dusky Salamander
Redback Salamander
Slimy Salamander

Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
N. Brown Snake
N. Redbelly Snake
E. Garter Snake
E. Ribbon Snake
N. Ringneck Snake

AMPHIBIANS

REPTILES

NORTHERN HARDWOOD-HEMLOCK - Young (cont.)

Four-toed Salamander
N. Spring Salamander
N. Red Salamander
N. Two-lined Salamander
Bullfrog
Green Frog
Mink Frog
Wood Frog
Pickerel Frog

N. Black Racer
E. Smooth Green Snake
E. Milk Snake
Timber Rattlesnake

NORTHERN HARDWOOD-HEMLOCK - Mature

Jefferson Salamander
Tremblay's Salamander
Blue-spotted Salamander
Spotted Salamander
E. Tiger Salamander
Red-spotted Newt
N. Dusky Salamander
Mountain Dusky Salamander
Redback Salamander
Slimy Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
N. Two-lined Salamander
American Toad
Bullfrog
Green Frog
Mink Frog
Wood Frog
N. Leopard Frog
S. Leopard Frog
Pickerel Frog

Common Snapping Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
N. Brown Snake
N. Redbelly Snake
E. Garter Snake
E. Ribbon Snake
N. Black Racer
E. Smooth Green Snake
E. Milk Snake
Timber Rattlesnake

NORTHERN HARDWOOD-HEMLOCK - Old

Jefferson Salamander
Tremblay's Salamander
Blue-spotted Salamander
Spotted Salamander
E. Tiger Salamander

Common Snapping Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink

AMPHIBIANS

REPTILES

NORTHERN HARDWOOD-HEMLOCK - Old (cont.)

Red-spotted Newt
N. Dusky Salamander
Mountain Dusky Salamander
Redback Salamander
Slimy Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
N. Two-lined Salamander
Bullfrog
Green Frog
Mink Frog
Wood Frog
N. Leopard Frog
S. Leopard Frog
Pickerel Frog

N. Brown Snake
N. Redbelly Snake
E. Garter Snake
E. Ribbon Snake
N. Black Racer
E. Smooth Green Snake
E. Milk Snake
Timber Rattlesnake

NORTHERN HARDWOOD-HEMLOCK - All Age

Jefferson Salamander
Tremblay's Salamander
Blue-spotted Salamander
Spotted Salamander
E. Tiger Salamander
Red-spotted Newt
N. Dusky Salamander
Mountain Dusky Salamander
Redback Salamander
Slimy Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
N. Two-lined Salamander
Bullfrog
Green Frog
Mink Frog
Wood Frog
N. Leopard Frog
S. Leopard Frog
Pickerel Frog

Common Snapping Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
N. Brown Snake
N. Redbelly Snake
E. Garter Snake
E. Ribbon Snake
N. Black Racer
E. Milk Snake
Timber Rattlesnake

AMPHIBIANS

REPTILES

SWAMP HARDWOODS - Regenerating

Marbled Salamander
Jefferson Salamander
Spotted Salamander
E. Tiger Salamander
Red-spotted Newt
Four-toed Salamander
Gray Treefrog
Bullfrog
Green Frog
Mink Frog

Common Snapping Turtle
Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
Queen Snake
E. Garter Snake
Shorthead Garter Snake
E. Hognose Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer
Black Rat Snake
E. Milk Snake
N. Water Snake

SWAMP HARDWOODS - Young

Marbled Salamander
Jefferson Salamander
Tremblay's Salamander
Spotted Salamander
E. Tiger Salamander
Red-spotted Newt
N. Dusky Salamander
Mountain Dusky Salamander
Redback Salamander
Slimy Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
N. Two-lined Salamander
American Toad
Fowler's Toad
N. Spring Peeper
Gray Treefrog
W. Chorus Frog
Upland Chorus Frog
Bullfrog
Green Frog
Mink Frog
N. Leopard Frog
S. Leopard Frog
Pickerel Frog
Wood Frog

Common Snapping Turtle
Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
N. Water Snake
Queen Snake
N. Brown Snake
N. Redbelly Snake
Shorthead Garter Snake
E. Ribbon Snake
E. Hognose Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer
E. Smooth Green Snake
Black Rat Snake
E. Milk Snake
N. Copperhead
E. Massasauga
Timber Rattlesnake
Rough Green Snake

AMPHIBIANS

SWAMP HARDWOODS - Mature

E. Tiger Salamander
Marbled Salamander
Jefferson Salamander
Tremblay's Salamander
Spotted Salamander
Red-spotted Newt
N. Dusky Salamander
Mountain Dusky Salamander
Redback Salamander
Slimy Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
N. Two-lined Salamander
American Toad
Fowler's Toad
N. Spring Peeper
W. Chorus Frog
Upland Chorus Frog
Bullfrog
Green Frog
Mink Frog
Wood Frog
N. Leopard Frog
S. Leopard Frog
Pickerel Frog

SWAMP HARDWOODS - Old

Marbled Salamander
Jefferson Salamander
Tremblay's Salamander
Spotted Salamander
E. Tiger Salamander
Red-spotted Newt
N. Dusky Salamander
Mountain Dusky Salamander
Redback Salamander
Slimy Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
N. Two-lined Salamander
N. Spring Peeper

REPTILES

E. Painted Turtle
Common Snapping Turtle
Bog Turtle
Wood Turtle
E. Box Turtle
Five-lined Skink
N. Coal Skink
N. Water Snake
Queen Snake
N. Brown Snake
N. Redbelly Snake
E. Garter Snake
E. Ribbon Snake
E. Hognose Snake
N. Ringneck Snake
E. Worm Snake
N. Black Racer
E. Smooth Green Snake
Black Rat Snake
E. Milk Snake
N. Copperhead
E. Massasauga
Timber Rattlesnake
Shorthead Garter Snake

Common Snapping Turtle
Bog Turtle
Wood Turtle
E. Box Turtle
E. Painted Turtle
Five-lined Skink
N. Coal Skink
N. Water Snake
Queen Snake
N. Brown Snake
N. Redbelly Snake
Shorthead Garter Snake
E. Ribbon Snake
E. Hognose Snake
N. Ringneck Snake

AMPHIBIANS

REPTILES

SWAMP HARDWOODS - Old (cont.)

W. Chorus Frog
Upland Chorus Frog
Bullfrog
Green Frog
Mink Frog
Wood Frog
N. Leopard Frog
S. Leopard Frog
Pickere1 Frog

E. Worm Snake
N. Black Racer
E. Smooth Green Snake
Black Rat Snake
E. Milk Snake
N. Copperhead
E. Massasauga
Timber Rattlesnake

NORTHERN RED OAK - Regenerating

Green Frog

Wood Turtle
E. Box Turtle
N. Coal Skink
N. Ringneck Snake
N. Black Racer
E. Smooth Green Snake
Black Rat Snake

NORTHERN RED OAK - Young

Green Frog

Wood Turtle
E. Box Turtle
N. Fence Lizard
N. Coal Skink
N. Redbelly Snake
E. Earth Snake
E. Hognose Snake
N. Ringneck Snake
N. Black Racer
E. Smooth Green Snake
Black Rat Snake
Timber Rattlesnake

NORTHERN RED OAK - Mature

Redback Salamander
Green Frog
Wood Frog

Wood Turtle
E. Box Turtle
N. Fence Lizard

AMPHIBIANS

NORTHERN RED OAK - Mature (cont.)

NORTHERN RED OAK - Old Age

E. Spadefoot
American Toad
Green Frog

OAK-PINE - Regenerating

N. Dusky Salamander
N. Two-lined Salamander
American Toad
Fowler's Toad
Gray Treefrog
New Jersey Chorus Frog
Green Frog
Wood Frog

OAK-PINE - Young

Spotted Salamander
Red-spotted Newt
Redback Salamander
N. Two-lined Salamander

REPTILES

N. Coal Skink
N. Redbelly Snake
E. Earth Snake
E. Hognose Snake
N. Black Racer
E. Smooth Green Snake
Black Rat Snake
N. Copperhead

Wood Turtle
Box Turtle
N. Fence Lizard
N. Coal Skink
N. Redbelly Snake
E. Earth Snake
E. Hognose Snake
N. Black Racer
E. Smooth Green Snake
Black Rat Snake
N. Copperhead

Wood Turtle
E. Box Turtle
N. Coal Skink
N. Black Racer
Black Rat Snake
E. Milk Snake

Wood Turtle
Box Turtle
E. Painted Turtle
N. Fence Lizard

AMPHIBIANS

OAK-PINE - Young (cont.)

E. Spadefoot
American Toad
Fowler's Toad
Gray Treefrog
New Jersey Chorus Frog
Green Frog

OAK-PINE - Mature

Jefferson Salamander
Spotted Salamander
Red-spotted Newt
N. Dusky Salamander
Mountain Dusky Salamander
Redback Salamander
Slimy Salamander
N. Two-lined Salamander
E. Spadefoot
American Toad
Fowler's Toad
N. Spring Peeper
New Jersey Chorus Frog
Green Frog
Wood Frog

OAK-PINE - Old Age

Spotted Salamander
Red-spotted Newt
N. Two-lined Salamander
E. Spadefoot
American Toad
Fowler's Toad
Green Frog

REPTILES

N. Coal Skink
N. Redbelly Snake
E. Earth Snake
E. Hognose Snake
N. Black Racer
Black Rat Snake
E. Milk Snake
N. Copperhead
Timber Rattlesnake

Wood Turtle
E. Box Turtle
E. Painted Turtle
N. Fence Lizard
N. Coal Skink
N. Redbelly Snake
E. Earth Snake
E. Hognose Snake
N. Black Racer
Black Rat Snake
E. Milk Snake
N. Copperhead
Timber Rattlesnake

Wood Turtle
E. Box Turtle
E. Painted Turtle
N. Fence Lizard
N. Coal Skink
N. Redbelly Snake
E. Earth Snake
E. Hognose Snake
N. Black Racer
Black Racer
E. Milk Snake
N. Copperhead

AMPHIBIANS

BALSAM FIR - Regenerating

BALSAM FIR - Young

Redback Salamander
American Toad
Mink Frog
Wood Frog

BALSAM FIR - Mature

Redback Salamander
American Toad
N. Spring Peeper
Mink Frog
Wood Frog

BALSAM FIR - Old Age

Mink Frog
Wood Frog

PINE - Regenerating

E. Tiger Salamander
Mountain Dusky Salamander
Redback Salamander

PINE - Young

E. Tiger Salamander
Mountain Dusky Salamander
Redback Salamander
American Toad

REPTILES

Wood Turtle

Wood Turtle
N. Brown Snake

Wood Turtle
N. Brown Snake

Wood Turtle
N. Brown Snake

Wood Turtle
E. Box Turtle
N. Black Racer

Wood Turtle
E. Box Turtle
N. Redbelly Snake
E. Ribbon Snake

AMPHIBIANS

PINE - Young (cont.)

New Jersey Chorus Frog

PINE - Mature

E. Tiger Salamander
Mountain Dusky Salamander
Redback Salamander
American Toad
New Jersey Chorus Frog

PINE - Old Age

E. Tiger Salamander
Redback Salamander
New Jersey Chorus Frog

SPRUCE-FIR - Regenerating

Spotted Salamander
E. Tiger Salamander
N. Red Salamander
Green Frog
Wood Frog
N. Leopard Frog

REPTILES

E. Earth Snake
E. Hognose Snake
N. Black Racer
E. Milk Snake
N. Copperhead

Wood Turtle
E. Box Turtle
N. Fence Lizard
N. Redbelly Snake
E. Ribbon Snake
E. Earth Snake
E. Hognose Snake
N. Black Racer
E. Milk Snake
N. Copperhead

Wood Turtle
E. Box Turtle
N. Fence Lizard
N. Redbelly Snake
E. Ribbon Snake
E. Earth Snake
E. Hognose Snake
N. Black Racer
E. Milk Snake
N. Copperhead

Bog Turtle
Wood Turtle

AMPHIBIANS

REPTILES

SPRUCE-FIR - Young

E. Tiger Salamander
Redback Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
American Toad
N. Spring Peeper
W. Chorus Frog
Green Frog
Mink Frog
Wood Frog
N. Leopard Frog

Bog Turtle
Wood Turtle
N. Brown Snake

SPRUCE-FIR - Mature

E. Tiger Salamander
Redback Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
Spotted Salamander
American Toad
N. Spring Peeper
W. Chorus Frog
Green Frog
Mink Frog
Wood Frog
N. Leopard Frog

Bog Turtle
Wood Turtle
N. Brown Snake

SPRUCE-FIR - Old Age

E. Tiger Salamander
Redback Salamander
Four-toed Salamander
N. Spring Salamander
N. Red Salamander
N. Spring Peeper
W. Chorus Frog
Green Frog
Mink Frog
Wood Frog
N. Leopard Frog

Bog Turtle
Wood Turtle
N. Brown Snake

AMPHIBIANS

SPRUCE - Regenerating

SPRUCE - Young

Four-toed Salamander
N. Spring Salamander
American Toad
W. Chorus Frog
Bullfrog
Mink Frog
Wood Frog

SPRUCE - Mature

Four-toed Salamander
N. Spring Salamander
W. Chorus Frog
Mink Frog
Wood Frog

SPRUCE - Old Age

Four-toed Salamander
N. Spring Salamander
W. Chorus Frog
Mink Frog
Wood Frog

HEMLOCK - Regenerating

HEMLOCK - Young

Redback Salamander
N. Spring Salamander
American Toad

REPTILES

Wood Turtle

Wood Turtle
N. Brown Snake

Wood Turtle
N. Brown Snake

Wood Turtle
N. Brown Snake

Bog Turtle
Wood Turtle

Bog Turtle
Wood Turtle
N. Redbelly Snake

AMPHIBIANS

HEMLOCK - Young (cont.)

N. Spring Peeper
Bullfrog

HEMLOCK - Mature

Red-spotted Newt
N. Dusky Salamander
Redback Salamander
Slimy Salamander
E. Spadefoot
American Toad
N. Spring Peeper
Bullfrog
Wood Frog
N. Leopard Frog

HEMLOCK - Old Age

Redback Salamander
E. Spadefoot
N. Spring Peeper
Bullfrog
Wood Frog
N. Leopard Frog

REPTILES

N. Ringneck Snake
N. Copperhead

Bog Turtle
Wood Turtle
N. Redbelly Snake
N. Ringneck Snake
N. Copperhead

Bog Turtle
Wood Turtle
N. Redbelly Snake
N. Ringneck Snake
N. Copperhead

TABLE 4. TIMBERED COMMUNITY TYPES --- NEW ENGLAND AREA

AMPHIBIAN SPECIES	NATIONAL FOREST ¹		LOCAL OCCURRENCE	HABITAT USE BY STAGE ²				HABITAT USE ³	SPECIALIZED HABITAT NEEDS ⁴	ASPEN	BIRCH	NORTHERN HARDWOOD - HEMLOCK	SWAMP HARD - WOODS	NORTHERN RED OAK	OAK - PINE	BALSA M FIR	PINE	SPRUCE - FIR	SPRUCE	HEMLOCK	
	WHITE MOUNTAIN (NH, ME.)	GREEN MOUNTAIN (VT.)		REPRODUCTION	LARVAE/YOUNG DEVELOPMENT	ADULT	FEEDING														HIBERNATION
HELLBENDER				A	A	A	A	A	X												
MUDPUPPY				A	A	A	A	A	X												
MARBLED SALAMANDER				T	A	T	T	T	X												
JEFFERSON SALAMANDER	✓			A	A	T	T	T	X												
TREMBLAY'S SALAMANDER				A	A	T	T	T	X												
BLUE-SPOTTED SALAMANDER	✓			A	A	T	T	T	X												
SILVERY SALAMANDER				A	A	T	T	T	X												
SPOTTED SALAMANDER	✓			A	A	T	T	T	X												
EASTERN TIGER SALAMANDER				A	A	T	T	T/A	X												
RED-SPOTTED NEWT	✓			A	T/A	A	T/A	T/A	X												
NORTHERN DUSKY SALAMANDER	✓			R	A	R	T	T/A	X												
MOUNTAIN DUSKY SALAMANDER				T/A	T	T	T/A	T	X												
REDBACK SALAMANDER	✓			T	T	T	T	T	X												
SLIMY SALAMANDER				T	T	T	T	T	X												
FOUR-TOED SALAMANDER	✓			T	A	T	T	T	X												
NORTHERN SPRING SALAMANDER	✓			A	A	T/A	T/A	T	X												
NORTHERN RED SALAMANDER				A	A	T/A	T/A	A	X												
NORTHERN TWO-LINED SALAMANDER	✓			A	A	T/A	T/A	T/A	X												
LONGTAIL SALAMANDER				A	A	T/R	T/A		X												
EASTERN SPADEFOOT				A	A	T	T	T	X												
AMERICAN TOAD	✓			A	A	T	T	T	X												
FOWLER'S TOAD	✓			A	A	T	T	T	X												
NORTHERN CRICKET FROG				A	A	A	A	A	X												

¹ SPECIES INVENTORY IN PROGRESS

³ R - REPRODUCING, F - FEEDING

● - PRIMARY HABITAT

² T - TERRESTRIAL, A - AQUATIC, R - RIPARIAN

⁴ X - REFER TO TEXT

TABLE 4 (CONT.) TIMBERED COMMUNITY TYPES --- NEW ENGLAND AREA

REPTILE SPECIES	NATIONAL FOREST ¹		LOCAL OCCURRENCE				HABITAT USE BY STAGE ²				HABITAT USE ³		SPECIALIZED HABITAT NEEDS ⁴											
	WHITE MOUNTAIN (NH ME)	GREEN MOUNTAIN (VT)	LOCAL OCCURRENCE				REPRODUCTION	LARVAE/YOUNG DEVELOPMENT	ADULT	FEEDING	HIBERNATION	SPECIALIZED HABITAT USE ³	SPECIALIZED HABITAT NEEDS ⁴											
													ASPEN	BIRCH	NORTHERN HARDWOOD HEMLOCK	SWAMP HARD-WOODS	NORTHERN RED OAK	OAK - PINE	BALSAM FIR	PINE	SPRUCE-FIR	SPRUCE	HEMLOCK	
COMMON SNAPPING TURTLE	/	/					T	A	A	A	A	R	X											
STINKPOT		/					T	A	A	A	A	R	X											
EASTERN MUD TURTLE							T	A	A	A	A	R												
SPOTTED TURTLE	/						T	A	A	A	A	R												
BOG TURTLE							T	A	A	A	A	R	X											
WOOD TURTLE	/	/					T	T	T	T	T/A	R	X											
EASTERN BOX TURTLE							T	T	T	T	T	R												
NORTHERN DIAMONDBACK TERRAPIN		/					T	A	A	A	A	R	X											
MAP TURTLE							T	A	A	A	A	R	X											
RED-EARED SLIDER							T	A	A	A	A	R												
REDBELLY TURTLE							T	A	A	A	A	R												
PLYMOUTH REDBELLY TURTLE							T	A	A	A	A	R												
EASTERN PAINTED TURTLE	/	/					T	A	A	A	A	R												
MIDLAND PAINTED TURTLE							T	A	A	A	A	R												
BLANDING'S TURTLE							T	A	T/A	T/A	T/A	R	X											
EASTERN SPINY SOFTSHELL							T	A	A	A	A	R	X											
NORTHERN FENCE LIZARD							T	T	T	T	T	R												
FIVE-LINED SKINK							T	T	T	T	T	R												
NORTHERN COAL SKINK							T	T	T	T	T	R												
NORTHERN WATER SNAKE	/	/					T	T/A	T/A	T/A	T/A	R												
QUEEN SNAKE							T	A	T/A	T/A	T	R												
NORTHERN BROWN SNAKE	/	/					T	T	T	T	T	R												
NORTHERN REDBELLY SNAKE	/	/					T	T	T	T	T	R												

¹ SPECIES INVENTORY IN PROGRESS

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TABLE 5. NON - TIMBERED COMMUNITY TYPES --- NEW ENGLAND AREA

AMPHIBIAN SPECIES	NATIONAL FOREST ¹		LOCAL OCCURRENCE	HABITAT USE BY LIFE STAGE ²					HABITAT USE ³	UPLAND OPENING					SAVANNA	ORCHARD	WETLAND								WATER		NON-VEG.					KRUHMHOLTZ ZONE	ALPINE ZONE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	WHITE MOUNTAIN (NH, ME)	GREEN MOUNTAIN (VT)		REPRODUCTION	LARVAE/YOUNG DEVELOPMENT	ADULT	FEEDING	HIBERNATION		UNDIFFERENTIATED	GRASS	FORB	SHRUB	PASTURE			UNDIFFERENTIATED	SEDEGE MEADOW	SHALLOW MARSH	DEEP MARSH	OPEN WATER <10a	SHRUB SWAMP	BOG	OPEN WATER >10a	STREAM	RIVER	BEACHES	BANKS	CLIFFS	CAVES	BUILDINGS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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TABLE 5 (CONT.) NON - TIMBERED COMMUNITY TYPES --- NEW ENGLAND AREA

REPTILE SPECIES	NATIONAL FOREST ¹		LOCAL OCCURRENCE	HABITAT USE BY STAGE ²				HABITAT USE ³	SPECIALIZED HABITAT NEEDS ⁴	UPLAND OPENING					ORCHARD	WETLAND									WATER				NON-VEG.					KRUHMHOLTZ ZONE	ALPINE ZONE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	WHITE MOUNTAIN (N.H., ME.)	GREEN MOUNTAIN (VT.)		REPRODUCTION	LARVAE/YOUNG DEVELOPMENT	ADULT	FEEDING			HIBERNATION	UNDIFFERENTIATED	GRASS	FORB	SHRUB		PASTURE	SAVANNA	UNDIFFERENTIATED	SEDGE MEADOW	SHALLOW MARSH	DEEP MARSH	OPEN WATER <10B	SHRUB SWAMP	BOG	OPEN WATER >10B	STREAM	RIVER	BEACHES	CLIFFS	CAVES	BUILDINGS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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NORTHEASTERN AMPHIBIANS AND REPTILES

Caudata

Cryptobranchidae

Eastern Hellbender *Cryptobranchus a. alleganiensis*

Necturidae

Mudpuppy *Necturus m. maculosus*

Ambystomatidae

Marbled Salamander *Ambystoma opacum*

Jefferson Salamander *Ambystoma jeffersonianum*

Tremblay's Salamander *Ambystoma tremblayi*

Blue-spotted Salamander *Ambystoma laterale*

Silvery Salamander *Ambystoma platineum*

Spotted Salamander *Ambystoma maculatum*

Eastern Tiger Salamander *Ambystoma t. tigrinum*

Salamandridae

Red-spotted Newt *Notophthalmus v. viridescens*

Plethodontidae

Northern Dusky Salamander *Desmognathus f. fuscus*

Mountain Dusky Salamander *Desmognathus ochrophaeus*

Redback Salamander *Plethodon cinereus*

Slimy Salamander *Plethodon g. glutinosus*

Four-toed Salamander *Hemidactylium scutatum*

Northern Spring Salamander *Gyrinophilus p. porphyriticus*

Northern Red Salamander *Pseudotriton r. ruber*

Northern Two-lined Salamander *Eurycea b. bislineata*

Longtail Salamander *Eurycea l. longicauda*

Anura

Pelobatidae

Eastern Spadefoot *Scaphiopus h. holbrookii*

Bufo

American Toad *Bufo a. americanus*

Fowler's Toad *Bufo woodhousei fowleri*

Hylidae

- Northern Cricket Frog *Acris c. crepitans*
Northern Spring Peeper *Hyla c. crucifer*
Greater and Lesser Gray Treefrog *Hyla v. versicolor*
Hyla v. chrysoscelis
Western Chorus Frog *Pseudacris t. triseriata*
Upland Chorus Frog *Pseudacris triseriata feriarum*
New Jersey Chorus Frog *Pseudacris triseriata kalmi*

Ranidae

- Bullfrog *Rana catesbeiana*
Green Frog *Rana clamitans melanota*
Mink Frog *Rana septentrionalis*
Wood Frog *Rana sylvatica*
Northern Leopard Frog *Rana pipiens*
Southern Leopard Frog *Rana sphenoccephala*
Pickereel Frog *Rana palustris*

Testudines

Chelydridae

- Common Snapping Turtle *Chelydra serpentina*

Kinosternidae

- Stinkpot *Sternotherus odoratus*
Eastern Mud Turtle *Kinosternon s. subrubrum*

Emydidae

- Spotted Turtle *Clemmys guttata*
Bog Turtle *Clemmys muhlenbergi*
Wood Turtle *Clemmys insculpta*
Eastern Box Turtle *Terrapene c. carolina*
Northern Diamondback Terrapin *Malaclemys t. terrapin*
Map Turtle *Graptemys geographica*
Red-eared Slider *Chrysemys scripta elegans*
Redbelly Turtle *Chrysemys r. rubriventris*
Plymouth Redbelly Turtle *Chrysemys rubiventris bangsi*
Eastern Painted Turtle *Chrysemys p. picta*
Midland Painted Turtle *Chrysemys picta marginata*
Blanding's Turtle *Emydoidea blandingi*

Trionychidae

- Eastern Spiny Softshell *Trionyx s. spiniferus*

Squamata

Lacertilia

Iguanidae

Northern Fence Lizard *Sceloporus undulatus hyacinthinus*

Scincidae

Five-lined Skink *Eumeces fasciatus*

Northern Coal Skink *Eumeces a. anthracinus*

Serpentes

Colubridae

Northern Water Snake *Nerodia s. sipedon*

Queen Snake *Regina septemvittata*

Northern Brown Snake *Storeria d. dekayi*

Northern Redbelly Snake *Storeria o. occipitomaculata*

Eastern Garter Snake *Thamnophis s. sirtalis*

Maritime Garter Snake *Thamnophis sirtalis pallidula*

Shorthead Garter Snake *Thamnophis brachystoma*

Eastern Ribbon Snake *Thamnophis s. sauritus*

Northern Ribbon Snake *Thamnophis sauritus septentrionalis*

Eastern Earth Snake *Virginia v. valeriae*

Eastern Hognose Snake *Heterodon platyrhinos*

Northern Rinkneck Snake *Diadophis punctatus edwardsi*

Eastern Worm Snake *Carphophis a. amoenus*

Northern Black Racer *Coluber c. constrictor*

Rough Green Snake *Opheodrys aestivus*

Eastern Smooth Green Snake *Opheodrys v. vernalis*

Black Rat Snake *Elaphe o. obsoleta*

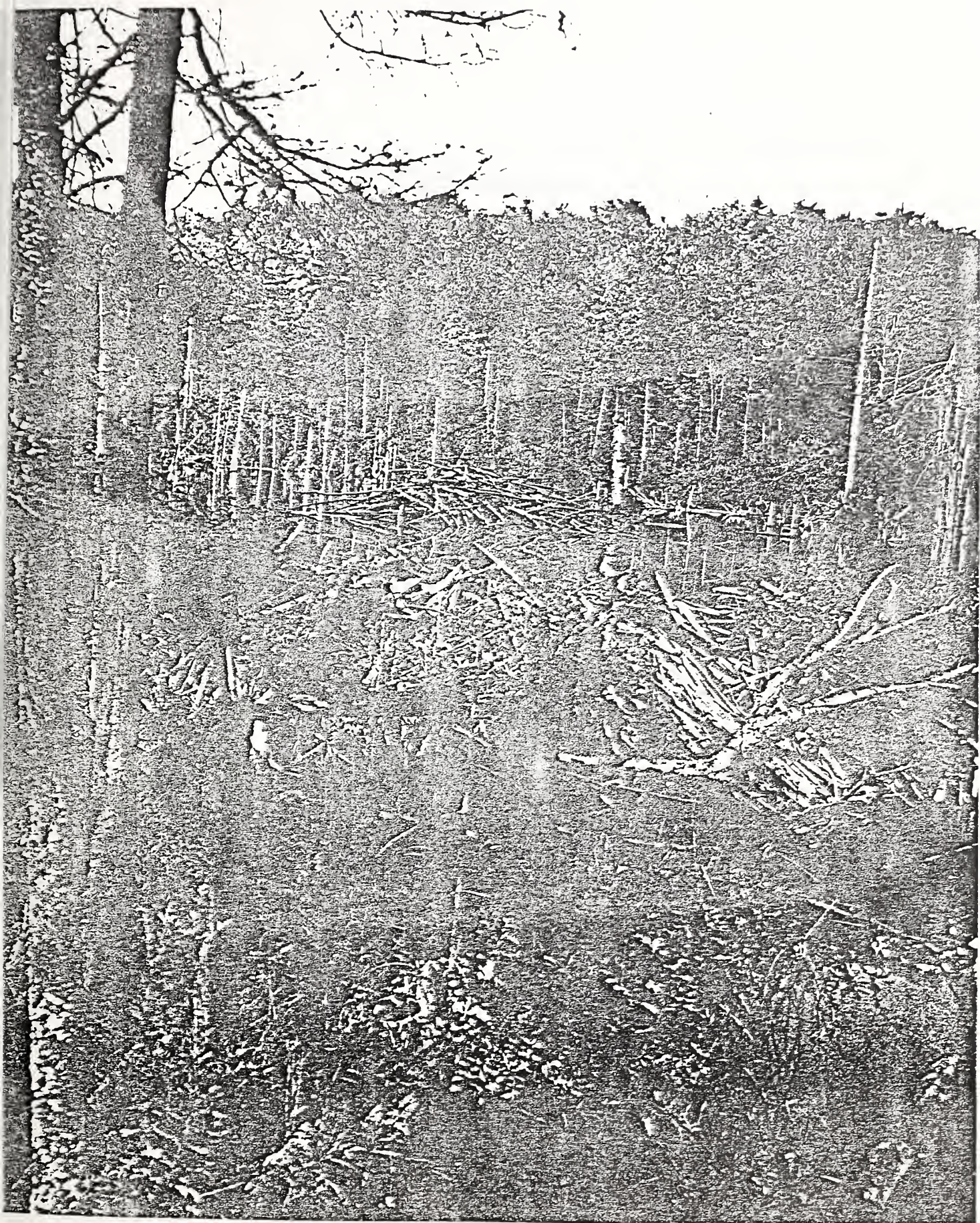
Eastern Milk Snake *Lampropeltis t. triangulum*

Viperidae

Northern Copperhead *Agkistrodon contortrix mokeson*

Eastern Massasauga *Sistrurus c. catenatus*

Timber Rattlesnake *Crotalus horridus*



AMPHIBIANS

Eastern Hellbender

Caudata

Cryptobranchus a. alleganiensis

Cryptobranchidae



Range: Susquehanna River drainage to Chesapeake Bay, throughout the Appalachians to n. Georgia and Alabama, north to s. Illinois. Disjunct population in c. Missouri possibly extending into s.e. Kansas.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: In clear, rapidly flowing rivers and permanent streams or brooks several feet deep, with rocks, logs, or other bottom objects to provide cover. Sometimes occurs in small rocky streams. Avoids silted streams (N. Green, pers. observ.).

Special Habitat Requirements: Rarely encountered in water above 20 C; this thermal barrier may partially explain restriction to upland streams (Dundee 1971:101.2).

Age/Size at Sexual Maturity: Estimated at 5 to 7 years (Minton 1972:27).

Breeding Period: Late August to September (Smith 1956:32).

Eastern Hellbender

Egg Deposition: August to September. The nest, a shallow excavation prepared by the male is built under large stones at the bottom of a stream or river.

No. Eggs/Mass: 300 to 450 eggs laid in long, tangled, paired strands.

Time to Hatching: 68 to 84 days, male guards nest (Oliver 1955:234).

Eggs Hatch: October to November in Kentucky; larval period: 2 years.

Home Range/Movement: In Missouri, 70% of 58 individuals recaptured were less than 30 m from the initial tagging site, 34% were found at the tagging site and only 3 individuals were over 90 m away in a springfed stream (Nickerson and Mays 1973). In a Pennsylvania creek 12 to 46 cm deep, the average home range of 72 individuals was 577 m²; 78% of ranges were smaller (median was 113 m²); 55% were found 10 m or less from the first capture site (Hillis 1969).

Food Habits/Preferences: Predatory, eating crayfish, small fish, mollusks, earthworms, insects, carrion, and sometimes their own eggs and young.

Comments: Perennially aquatic and essentially nocturnal. Available habitat has declined due to industrial pollution and lowered oxygen levels, eliminating the e. hellbender from much of its former range (Dodd 1979).

Selected References: Bishop 1947, Dundee 1971.

Mudpuppy

Caudata

Necturus m. maculosus

Necturidae



Range: St. Lawrence River west to s.e. Manitoba, south to e. Kansas and n. Alabama and through c. Pennsylvania to New York and the Lake Champlain Valley. Absent from the Adirondacks. Introduced in parts of New England.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Entirely aquatic. Clear or muddy waters of lakes, rivers, ditches, large streams. One individual found at 90 ft (27.4 m) in Lake Michigan (Behler and King 1979:283). Often found in submerged log piles around the bases of bridge pilings in larger rivers.

Special Habitat Requirements: Moving water.

Age/Size at Sexual Maturity: At 5 years and at 8 in (20.3 cm) total length (Bishop 1947:43). Retains external gills as an adult.

Breeding Period: Autumn (Bishop 1947:42).

Mudpuppy

Egg Deposition: May and June of the year following mating. Reproduces in flowing water (Oliver 1955:211). Prefers water depths of at least 3 ft (0.9 m) and bottoms with weeds and rocks to provide nesting cover. Nest sites often under large rock slabs in water depths of 6 to 8 in (15 to 20 cm) in New York (Stewart 1961:68).

No. Eggs/Mass: 18 to 180 eggs (average 60 to 100) in water beneath objects, attached singly by stalks (Bishop 1941:26).

Time to Hatching: 38 to 63 days, female guards eggs (Bishop 1941:27).

Home Range/Movement: Unreported.

Food Habits/Preferences: In New York, aquatic insects comprised 30% of the diet by weight, particularly nymphs and larval forms, crustaceans 33%, small fish 13%, also mollusks, spawn, other amphibians, worms, leeches and plants (Hamilton 1932). Most food captured at night along the bottom.

Comments: The mudpuppy is chiefly nocturnal, bottom dwelling, and active through the winter, when it moves to deeper water.

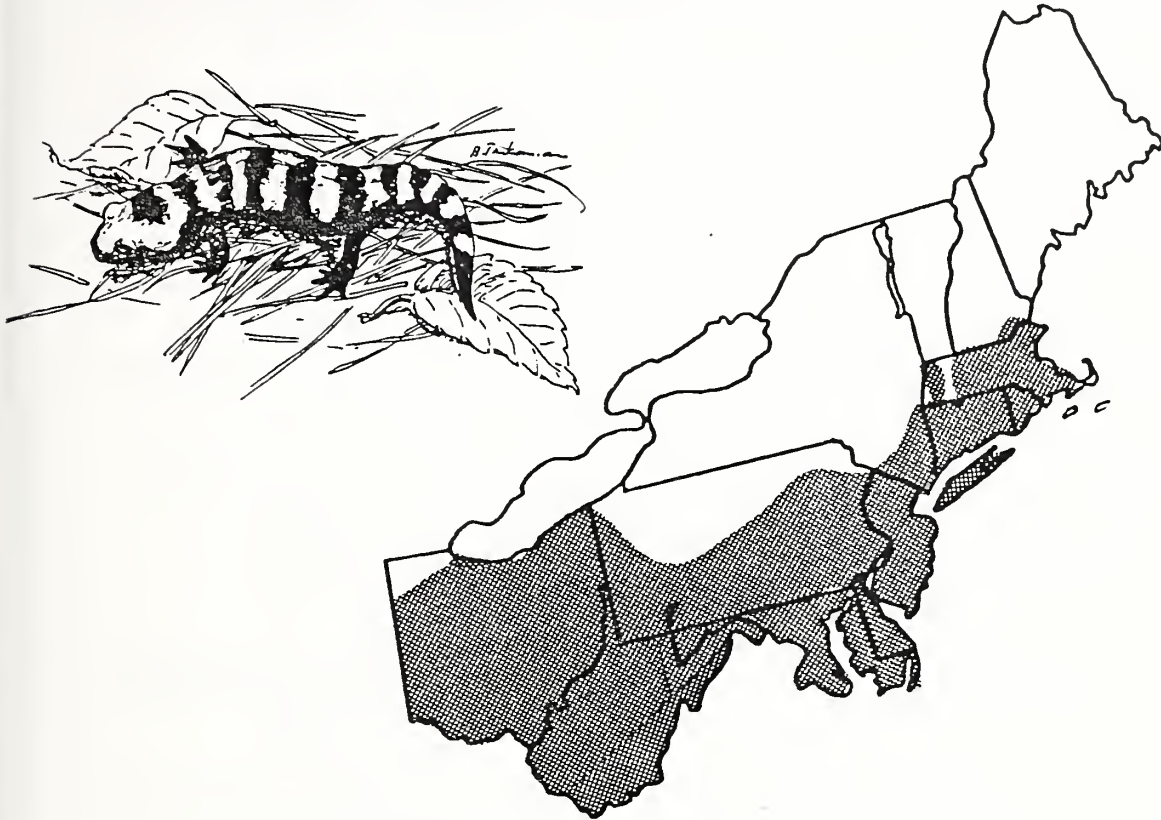
Selected References: Bishop 1947, Logier 1952.

Marbled Salamander

Ambystoma opacum

Caudata

Ambystomatidae



Range: New Hampshire and c. Massachusetts, c. Pennsylvania to s. Illinois, s. Missouri to e. Texas. Throughout the e. U.S. except s. Louisiana and Florida.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Sandy and gravelly areas of mixed deciduous woodlands, especially oak-maple and oak-hickory (Minton 1972:46), trap rock slopes (M. Klemens, pers. commun.). During breeding season found in low areas around ponds, swamps and quiet streams. Inhabits somewhat dryer areas than other species of *Ambystoma*. During the summer usually found under logs and rocks. Larvae usually found in temporary water throughout the winter. Probably hibernates in deep burrows.

Special Habitat Requirements: Ponds or swamps in wooded areas for breeding.

Age/Size at Sexual Maturity: 15 to 18 months.

Breeding Period: During the fall, adults migrate to breeding areas (September in northern parts of range).



Marbled Salamander

Egg Deposition: September to early October in northern parts of range (Bishop 1941:138).

No. Eggs/Mass: 50 to 232 (average 100) eggs laid singly in shallow depressions beneath surface materials (Bishop 1941:142). Eggs laid in dry beds of temporary ponds and streams or on land, or at the edge of ponds or swamps, where they will be washed into the water to hatch.

Time to Hatching: 15 to 207 days; female forms a nest site and may brood eggs (Oliver 1955:234).

Eggs Hatch: Usually in fall or early winter when submerged but without rain will hatch in spring.

Larval Period: Larvae overwinter with little growth until spring, and transform to terrestrial form in late May to June (Noble and Brady 1933). A higher temperature and abundant food supply will hasten metamorphosis (Stewart 1956b). The larval period was 135 days in New Jersey (Hassinger et al. 1970).

Home Range/Movement: Adults migrate an average of 194 m from breeding sites to summer range in Indiana (Williams 1973 cited in Semlitsch 1980b:320).

Food Habits/Preferences: Arthropods, including adults and larval insects and crustaceans. Also takes earthworms and mollusks. Marbled salamander larvae eat small aquatic insects, crustaceans and other small invertebrates and are cannibalistic (Minton 1972:47). Larvae rise in the water column to feed (T. Tynning, pers. commun.).

Comments: Terrestrial and nocturnal, often using runways of other animals or tunnels through loose soil. Young larvae are aquatic and primarily nocturnal.

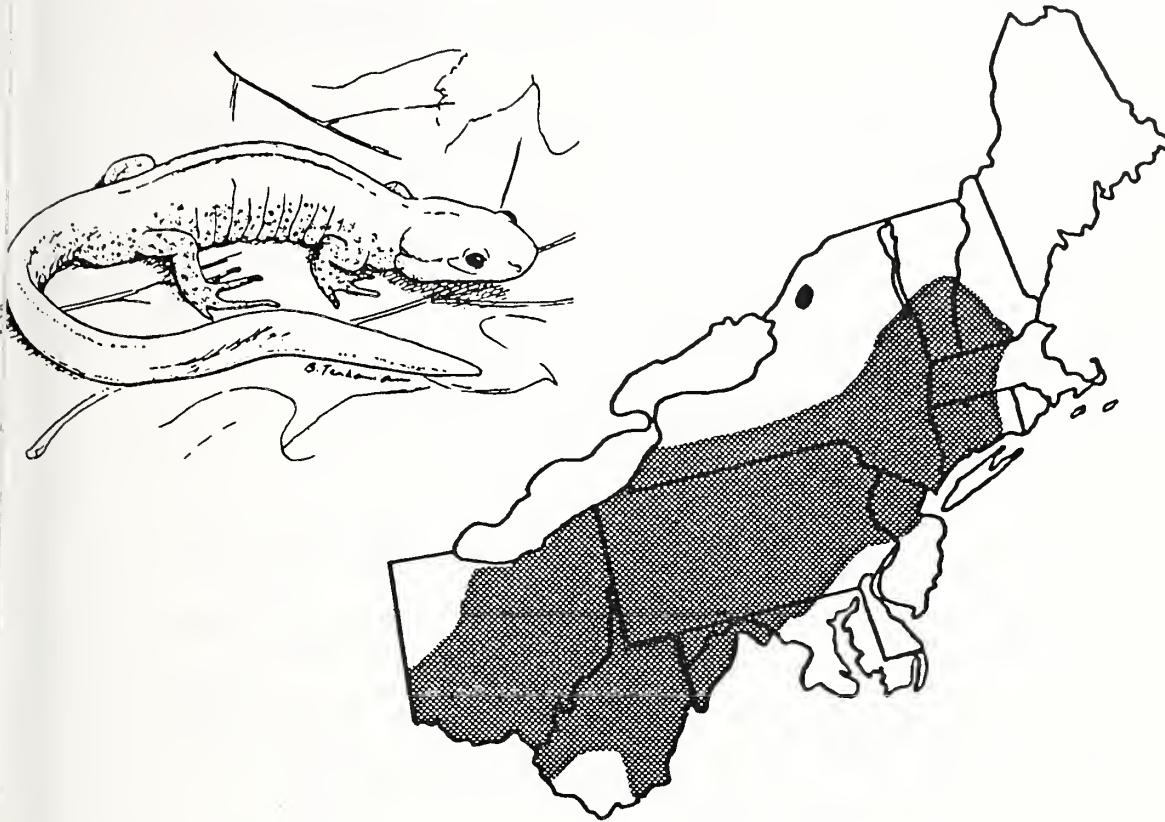
Selected References: Bishop 1941, Anderson 1967b, Hassinger et al. 1970, Lazell 1979.

Jefferson Salamander

Caudata

Ambystoma jeffersonianum

Ambystomatidae



Range: Western New England to w.c. Indiana, c. Kentucky to w. Virginia and north to n. New Jersey.

Relative Abundance in the Northeast: Locally common to rare.

Habitat in the Northeast: Terrestrial, found in undisturbed damp, shady deciduous or mixed woods, bottomlands, swamps, ravines, moist pastures, or lakeshores. Hides beneath leaf litter, under stones or in decomposing logs and stumps. Cleared strips create a barrier for dispersal (Pough and Wilson 1976). In Connecticut, members of the *Ambystoma jeffersonianum* complex are more abundant and widespread in upland areas of the Connecticut River Valley (M. Klemens, pers. commun.). Hibernates on land in winter months, usually near breeding waters.

Special Habitat Requirements: Requires temporary ponds for breeding period.

Age/Size at Sexual Maturity: Females at 21 months (Bishop 1941:102), snout to vent length 70 to 75 mm males, 75 to 80 mm females (Minton 1954). Juveniles probably enter the breeding population at 2 to 3 years of age (Wilson 1976 cited in Thompson et al. 1980:119).

Jefferson Salamander

Breeding Period: February to April, migrates to ponds for spawning (Brandon 1961).

Egg Deposition: February to April, often beneath ice. Will tolerate pH of 4 to 8, with best hatching success at 5 to 6 pH range (Pough and Wilson 1976). Isolated upland pools bordered by shrubs and surrounded by forest were primary breeding sites in Maryland (Thompson et al. 1980).

No. Eggs/Mass: 107 to 286 eggs (Oliver 1955:234). Many variations of egg deposition, laid singly or in small cylindrical masses of 1 to 35 eggs each, in water attached to twigs or plants, under rocks, or in the bottom detritus of a pond (Stille 1954), in small pools of bogs (Bleakney 1957). Egg masses average 16 eggs per mass (Bishop 1941:94).

Time to Hatching: 30 to 45 days (Bishop 1947:135). 13 to 45 days (Oliver 1955:234).

Larval Period: 56 to 125 days (Bishop 1941:99). Found overwintering in Nova Scotia (Bleakney 1952).

Home Range/Movement: Adults migrated an average of 252 m from breeding ponds to summer range in Indiana. Newly metamorphosized individuals moved an average 92 m from the ponds (Williams 1973 cited in Semlitsch 1980b:320).

Food Habits/Preferences: Small invertebrates, including worms, millipedes, spiders, insects, and aquatic crustaceans. Feeds on most animal life that it can capture.

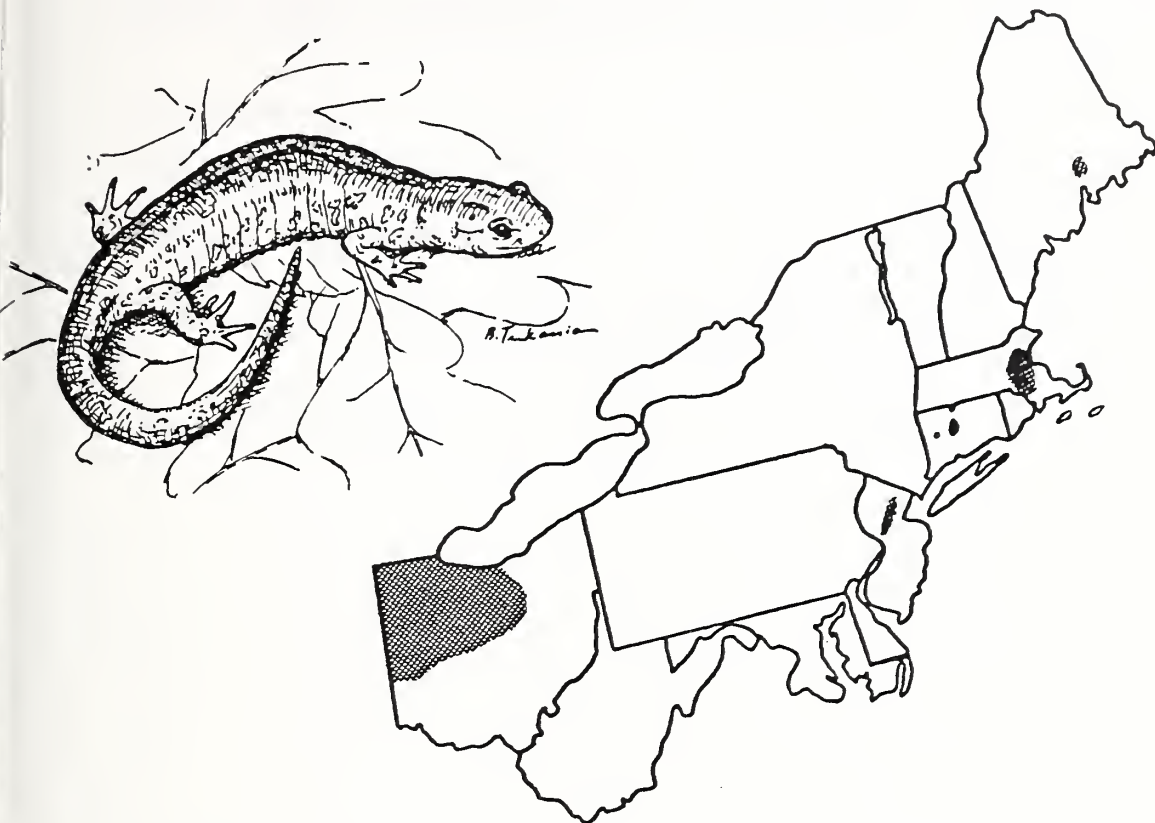
Selected References: Logier 1952, Uzzell 1967a, Pough and Wilson 1976.

Tremblay's Salamander

Caudata

Ambystoma tremblayi

Ambystomatidae



Range: Disjunct colonies in New Brunswick, Ottawa River drainage, e. Massachusetts, n.w. Ohio, Indiana and Michigan, and n. Wisconsin. (Connecticut record dependent on interpretation of electrophoretic data.).

Relative Abundance in the Northeast: Rare.

Habitat in the Northeast: Deciduous forests surrounding small ponds or takes (Minton 1972:37). Have been found under logs.

Special Habitat Requirements: Woodland ponds for breeding.

Age/Size at Sexual Maturity: Unreported.

Breeding Period: March in Indiana (Minton 1972:38).

Egg Deposition: April (Uzzell 1964).

No. Eggs/Mass: 135 to 162 eggs (Uzzell 1964), laid in groups of 2, 3, or 4, sometimes singly, in small clusters at pond bottoms or attached to submerged sticks (Uzzell 1967a:50.1).

Tremblay's Salamander

Larval Period: Transform in 95 to 101 days (Uzzell 1964). Larval period shortens as eggs are deposited later in the spring.

Time to Hatching: Unreported.

Home Range/Movement: Unreported.

Food Habits/Preferences: Thought to be similar to *A. laterale*.

Comments: Triploid of hybrid origin (similar to *A. laterale*).
Female population only, depends on males of *A. laterale* to stimulate egg development (Uzzell 1964).

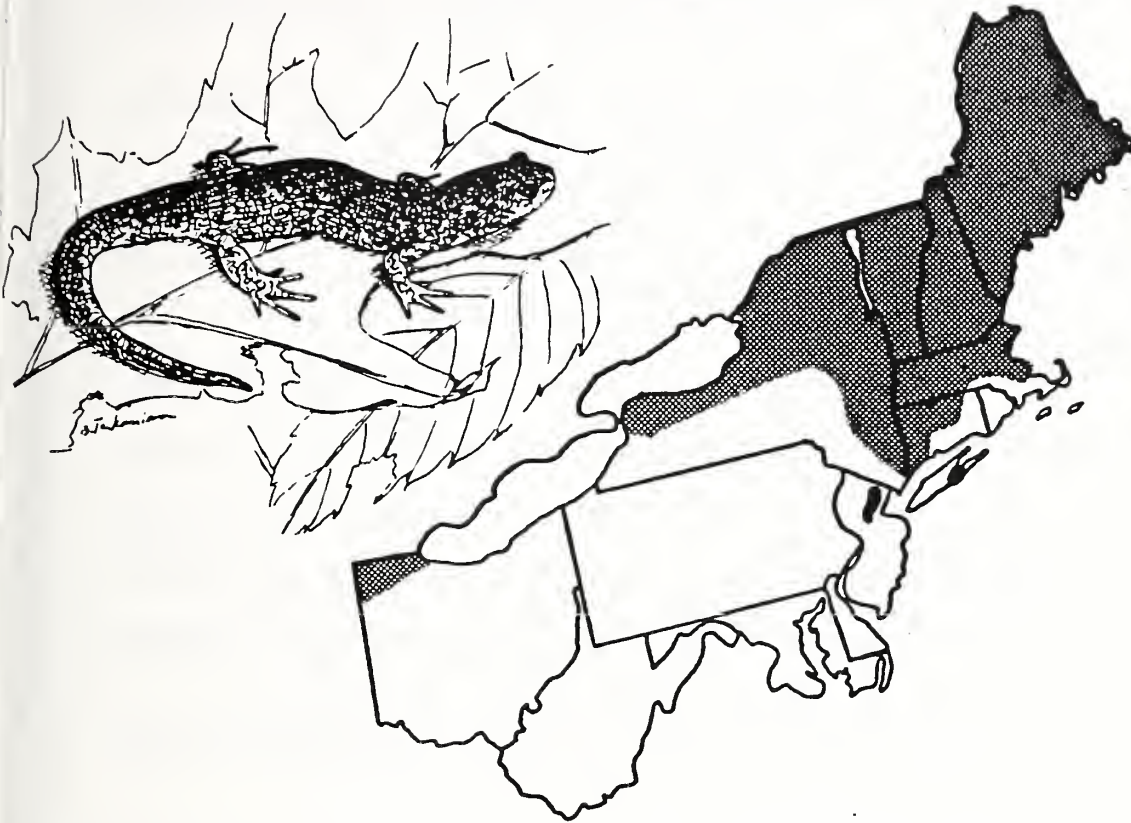
Selected References: Uzzell 1964, 1967a; Minton 1972.

Blue-spotted Salamander

Ambystoma laterale

Caudata

Ambystomatidae



Range: Southeastern Quebec and the n. shore of the Gulf of St. Lawrence to James Bay and the s. end of Lake Winnipeg, south to n. Illinois and Indiana, n. New York and New England. Disjunct colonies in New Jersey, Long Island, Iowa and Labrador.

Relative Abundance in the Northeast: Rare; threatened in southern portion of range.

Habitat in the Northeast: Wooded, swampy or moist areas (Minton 1954). Occasionally in overgrown pastures. Sometimes occurs where soil is sandy, and may be found under logs or other forest debris. Occurs in a wide range of elevations (in w. Connecticut) and along the Connecticut River floodplain (M. Klemens, pers. commun.).

Special Habitat Requirements: Ponds or semi-permanent water for breeding.

Age/Size at Sexual Maturity: Snout to vent length of 47 to 55 mm in Indiana (Minton 1954).

Breeding Period: During early spring rains when night temperatures are above freezing (Lazell 1968).

Egg Deposition: March to early April. Eggs are laid on the bottoms of temporary shallow forest ponds, roadside drainage ditches, kettle holes (Landre 1980), attached to litter (Stille 1954), and twigs (Uzzell 1967b:48.1).

No. Eggs/Mass: 199 to 247 eggs (Uzzell 1964), 82 to 489 (Minton 1972:36). Laid in clusters of less than 30 eggs per cluster (Bleakney 1957), 6 to 10 eggs per mass (Landre 1980).

Time to Hatching: About 1 month (Smith 1961:28).

Larval Period: Extending to late June or mid-August (Smith 1961:28).

Home Range/Movement: Unreported.

Food Habits/Preferences: Arthropods, annelids and centipedes.

Comments: Acid precipitation and habitat loss are major threats to this species in the Northeast.

Selected References: Bleakney 1957; Uzzell 1964, 1967b; Landre 1980.

Silvery Salamander

Caudata

Ambystoma platineum

Ambystomatidae



Range: Occurs with *A. jeffersonianum*; however, range is mainly restricted to areas north of the Wisconsin Glacial border where ranges of *A. jeffersonianum* and *A. laterale* meet or overlap. Central Indiana east to n. New Jersey and w. Massachusetts.

Relative Abundance in the Northeast: Locally common.

Habitat in the Northeast: Probably similar to that of *A. jeffersonianum*.

Special Habitat Requirements: See *A. jeffersonianum*.

Age/Size at Sexual Maturity: Unreported.

Breeding Period: March to April (Behler and King 1979:296).

Egg Deposition: Unreported.

No. Eggs/Mass: Typically 15 to 20 eggs/mass, in cylindrical masses attached to submerged twigs and grass stems. Rarely if ever attached to pond bottom debris (Uzzell 1967c:49.1).

Home Range/Movement: Unreported.

Food Habits/Preferences: Unreported.

Comments: A hybrid of Jefferson and blue-spotted salamanders with 3 sets of chromosomes (2 sets from Jefferson and 1 from blue-spotted). Most are female, only one male has been recorded (Smith 1978:88). Genetic material is not contributed by male Jefferson; the sperm only stimulates egg production (Uzzell 1964). *A. jeffersonianum* and *A. laterale* probably developed from a common ancestor that was reproductively isolated by the Wisconsin Glaciation. As the glacier retreated and the two species mixed, hybridization occurred (Uzzell 1964).

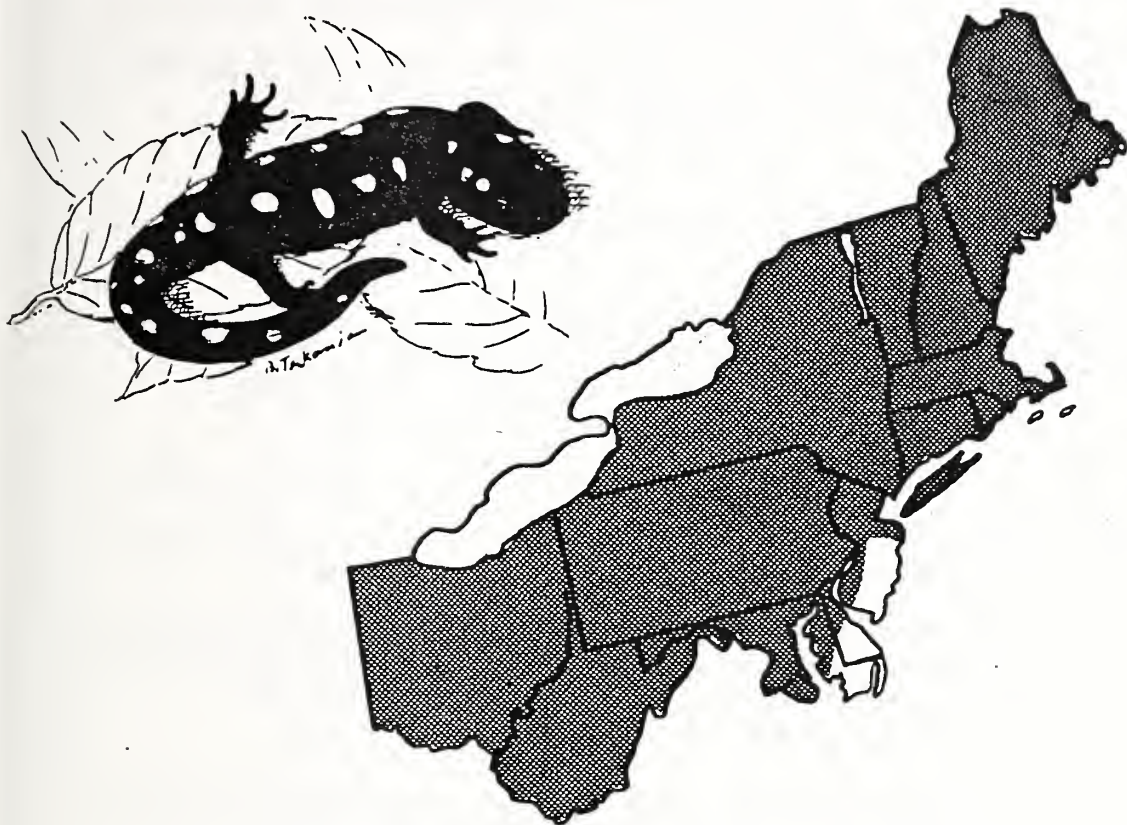
Selected References: Uzzell 1964, 1967c; Smith 1978.

Spotted Salamander

Ambystoma maculatum

Caudata

Ambystomatidae



Range: Nova Scotia and the Gaspé Peninsula to s. Ontario, south through Wisconsin, s. Illinois excluding prairie regions, to e. Kansas and Texas, and through the e. U.S., except Florida, the Delmarva Peninsula and s. New Jersey.

Relative Abundance in the Northeast: Common, although populations declining, probably due to acid precipitation.

Habitat in the Northeast: Fossorial; found in moist woods, streambanks, beneath stones, logs, boards. Prefers deciduous or mixed woods on rocky hillsides and shallow woodland ponds or marshy pools that hold water through the summer for breeding. Usually does not inhabit ponds containing fish. Terrestrial hibernator. In summer often wanders far from water source. Found in low oak-hickory forests with creeks and nearby swamps in Illinois (Cagle 1942 cited in Smith 1961:30).

Special Habitat Requirements: Mesic woods with semi-permanent water for breeding. Eggs tolerate a pH range of 6 to 10 with best hatching success at pH of 7 to 9 (Pough and Wilson 1976). High embryonic mortality occurred in temporary pools with pH below 6.0 in New York (Pough 1976).

Age/Size at Sexual Maturity: During second year.

Breeding Period: March to mid-April. Large numbers congregate at night at breeding ponds and may use the same track each year (Shoop 1965). Breeding migrations occur during steady evening rainstorms.

Egg Deposition: 1 to 6 days after first appearance of adults at ponds (Bishop 1941:114).

No. Eggs/Mass: 100 to 200 eggs, average of 125, laid in large masses of jelly, sometimes milky, attached to stems about 15 cm (6 in) under water. Each female lays 1 to 10 masses (average of 2 to 3) of eggs (Wright and Allen 1909).

Time to Hatching: 31 to 54 days (Bishop 1947:145).

Larval Period: 61 to 110 days, found overwintering in Nova Scotia (Bleakney 1952). Transforms July to September.

Home Range/Movement: Individuals have been found up to 1/4 mi (400 m) from the nearest breeding site in North Carolina (Gordon 1968). Will travel 91.2 to 182.4 m (100 to 200 yd) from woods to ponds in open meadows in New York (M. Stewart, pers. commun.).

Food Habits/Preferences: Earthworms, snails, slugs, insects, spiders, particularly larval and adult beetles (Wacasey 1961). Larval stage may also eat small fish. Cannibalism by larvae occurs under crowded conditions.

Comments: Nocturnal; travel only on ground surface for migrations to and from breeding pools. Rainfall, snowmelt, or high humidity coupled with air temperature of 10 C (50°F) or more, are necessary for migrations to breeding pools. Numbers declining, primarily due to over-collection and acid rain.

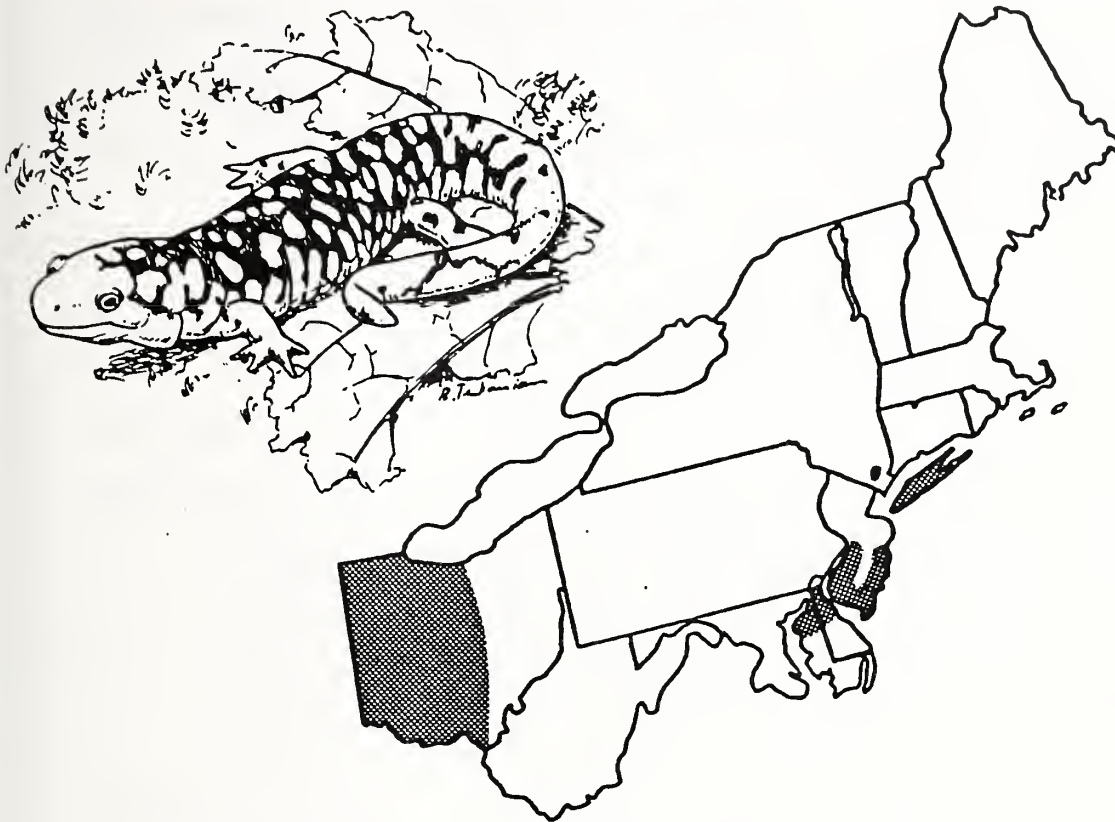
Selected References: Shoop 1965, Anderson 1967a.

Eastern Tiger Salamander

Caudata

Ambystoma t. tigrinum

Ambystomatidae



Range: Long Island along the Atlantic Coast to n. Florida. Central Ohio to s.e. Manitoba and south through e. Texas to the Gulf of Mexico. Absent from the Appalachian uplands and the lower Mississippi delta area.

Relative Abundance in the Northeast: Rare.

Habitat in the Northeast: Terrestrial, burrowing species found in moist woods, pine woods, alpine forests or open grasslands, marshes, swamps, cultivated areas, disturbed areas. Populations found in gravel pit ponds in New Jersey. Digs burrows or uses those of other animals, but is also found under rocks and logs. Hibernates at the bottom of ponds or underground.

Special Habitat Requirements: Mesic woods, ponds for breeding.

Age/Size at Sexual Maturity: Spring after transformation (Bishop 1941:169).

Breeding Period: Early spring; March in north. This species regularly breeds during the "January thaw" in New Jersey with eggs remaining under the ice a month after deposition (Hassinger et al. 1970). Breeds in the deep water of woodland or farm ponds, deeper water than that used by the spotted salamander (*A. maculatum*).

Egg Deposition: Late February to late March.

No. Eggs/Mass: Approximately 1000 eggs (Smith 1956:42), average 44 to 59 eggs/mass (Hassinger et al. 1970), 23 to 110 eggs/mass (Bishop 1941:162), laid singly or in gelatinous clumps free or attached to submerged weeds or twigs (Gehlbach 1967:52.1).

Time to Hatching: 14 to 30 days or longer, 30 to 40 days in the Northeast (Hassinger et al. 1970).

Larval Period: 75 to 140 days (Bishop 1941:167). Metamorphosis triggered by drying of ponds (Hassinger et al. 1970).

Home Range/Movement: Unreported.

Food Habits/Preferences: Isopods, terrestrial insects, centipedes, earthworms, spiders, and other small invertebrates including mollusks. Also take small fish, frogs, tadpoles, smaller salamanders of their own or other species and occasionally young mice. Most common food items are those found in moist, dark microhabitats (Lindquist and Bachman 1970). Larvae are nocturnal feeders. *A. tigrinum* will hide in their burrows with their heads at the surface to seize nearby prey items (Gruberg and Stirling 1972).

Comments: Nocturnal. Disappearing rapidly due to habitat destruction; may no longer occur in New York State outside Long Island (M. Stewart, pers. commun.).

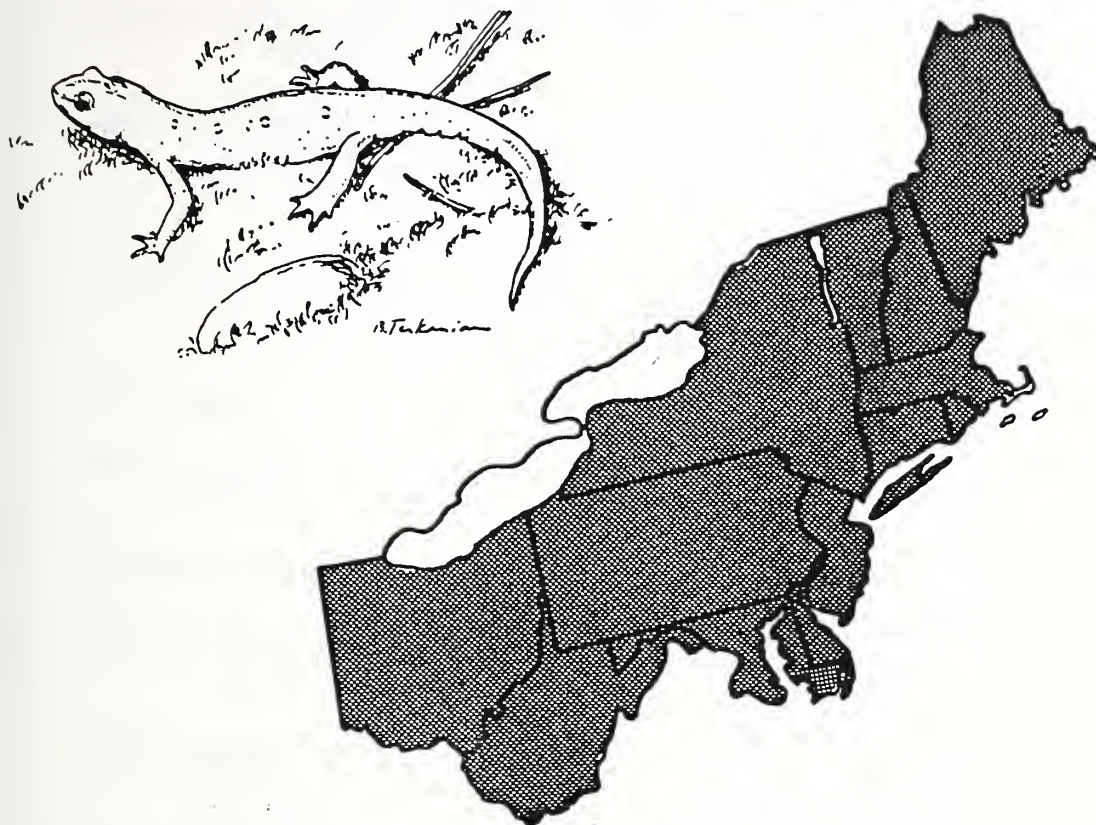
Selected References: Bishop 1941, Smith 1961, Gehlbach 1967.

Red-spotted Newt

Caudata

Notophthalmus v. viridescens

Salamandridae



Range: Nova Scotia and the Gaspé Peninsula west to the n. shore of Lake Superior and e. Michigan south to c. Alabama, n.c. Georgia. Absent along coast from s.e. South Carolina, southward.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Adults found in ponds, particularly water with abundant submerged vegetation, and in weedy areas of lakes, marshes, ditches, backwaters, and pools of shallow slow-moving streams or other unpolluted shallow or semi-permanent water. Juveniles live in moist areas on land, typically under damp leaves, under brush piles or logs and stumps, usually in wooded habitats. More common in areas of higher elevation in Connecticut (M. Klemens, pers. commun.); from sea level to 1.6 km elevation on Mt. Marcy in the Adirondacks (M. Stewart, pers. observ.). Moist beech-maple-hemlock woods in New York (Hurlbert 1969), and oak-pine woods in Massachusetts (Healy 1974). May be seen moving about on wet days in spring and summer. Some may hibernate on land, burrowing under logs and debris, but most adults remain active all winter underwater in pond bottoms or in streams. During winter months often found semi-active in groups of 20 to 40 (Morgan and Grierson 1932).

Red-spotted Newt

Special Habitat Requirements: Water with aquatic vegetation for the adult newt.

Age/Size at Sexual Maturity: 2 to 8 years (Healy 1974). Aquatic juveniles feed almost year-round and mature in 2 years. The eft feeds only during rainy summer periods and requires more time to reach maturity.

Breeding Period: Spring (April to June), fall (August to October), sometimes November to December (Hurlbert 1969). Characteristically breed in lakes, ponds, and swamps (Hurlbert 1970).

Egg Deposition: Late March to June.

No. Eggs/Mass: 200 to 375 eggs (Bishop 1941:64), laid in water, attached singly to the leaves of aquatic plants.

Time to Hatching: 3 to 5 weeks (Logier 1952:64), temperature dependent.

Larval Period: 12 to 16 weeks. Post-larval migration from aquatic to terrestrial habitat occurs from summer through late fall during diurnal rainfall in New York (Hurlbert 1970).

Home Range/Movement: Approximately 270 m^2 for red efts (juveniles) in an oak-pine woodland in w. Massachusetts; maximum daily movement was 13 m (Healy 1974). Average movement along the edge of a small pond in Pennsylvania was 10.1 ft (3.1 m) for females, and 11.2 ft (3.4 m) for males; most individuals remained within 5 ft (1.5 m) of shore (Bellis 1968).

Food Habits/Preferences: Both adults and larvae are opportunistic feeders (Burton 1977). Insects and their larvae, particularly mayfly, caddisfly, midge and mosquito larvae (Ries and Bellis 1966), springtails (MacNamara 1977); tadpoles, frog eggs, worms, leeches, small mollusks and crustaceans, spiders, mites, occasionally small minnows (Hamilton 1932), salamander eggs also a major food item (T. Tynning, pers. commun.). Also ingests molted skin. Snails are an important food source for the red eft (Burton 1976). Cannibalism on their own larvae provides an important component of the diet in July and August (Burton 1977).

Comments: Mates in ponds and streams. The red eft, the juvenile terrestrial form of the red-spotted newt, remains on land for 2 to 7 years; most remain on land 4 to 5 years, then return to the water where they transform to aquatic adults (Healy 1974). Some individual populations omit the terrestrial eft stage. Skin secretions of red efts are highly toxic--about 10 times more toxic than those of adults (Brodie 1968).

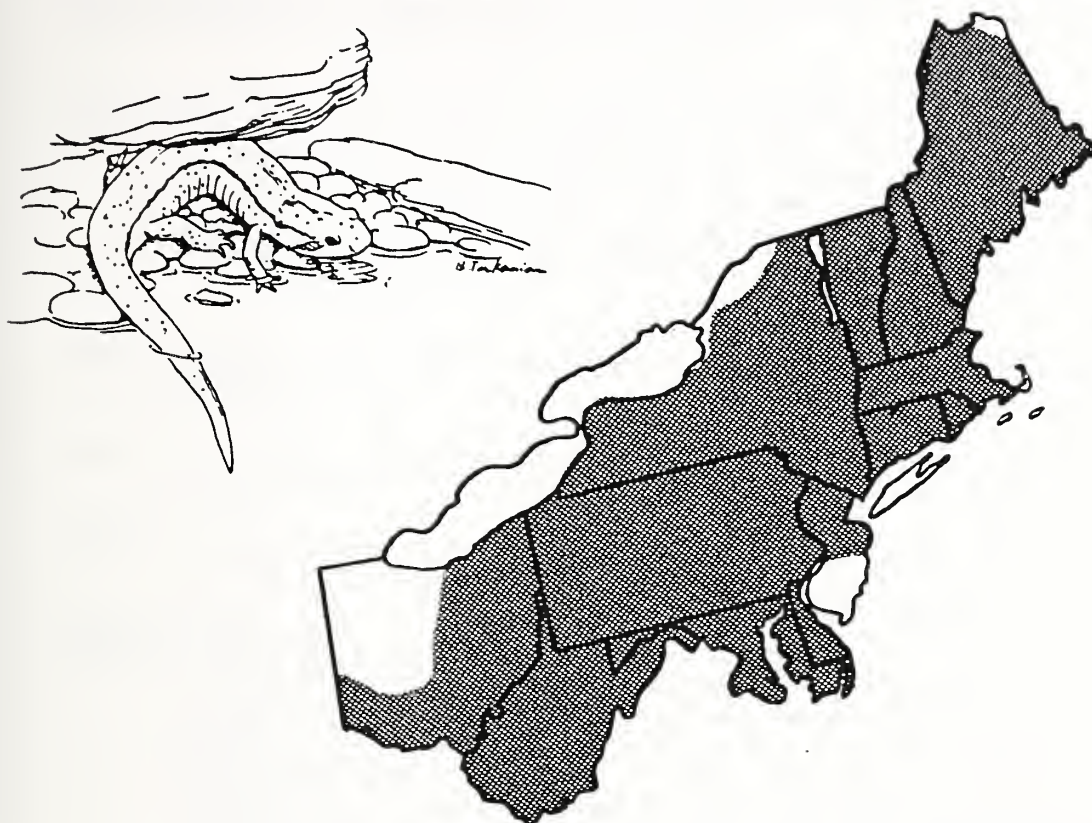
Selected References: Bishop 1947, Mecham 1967.

Northern Dusky Salamander

Caudata

Desmognathus f. fuscus

Plethodontidae



Range: Southern New Brunswick and s. Quebec to s.e. Indiana and c. Kentucky to the Carolinas; throughout the Northeast excluding s. New Jersey.

Relative Abundance in the Northeast: Common to abundant.

Habitat in the Northeast: In woodlands at the margins of cool running water, favors clear rocky streams; in springy banks, seepage areas, beds of semi-dry brooks; under the cover of wet leaves, moss, rock piles, other debris, or in burrows in the soil. Ventures from streamside only during wet weather. Occurs from sea level to mountain elevations. Moves under logs and rocks in deeper water to hibernate in September. May remain active throughout the winter in stream bottoms or deep in unfrozen soil (Ashton and Ashton 1978).

Special Habitat Requirements: Permanent streams or seeps in woodlands.

Age/Size at Sexual Maturity: About 3 years (Dunn 1926:92), males at 3.5 years, females deposit first eggs at 5 years (Organ 1961). Males mature at 2 years, females at 3 years (Danstedt 1975). Body size at maturity varies between populations (Tilley 1968).

Northern Dusky Salamander

Breeding Period: Biannual cycle occurring late spring and fall (Organ 1961). Breeds in ponds or streams.

Egg Deposition: July to late August in w. Pennsylvania (Krysiak 1980). Female guards the eggs in damp hollows beneath stones, under loose bark of logs, between wet leaf litter layers and in moss close to the water's edge. Larvae move to water where development continues (M. Stewart, pers. commun.). Clutches found less than 50 cm from the edge of streams and springs or in seepage areas (Krysiak 1980).

No. Eggs/Mass: 8 to 28 stalked eggs in clusters, average 17 (Bishop 1941:314).

Time to Hatching: 52 to 57 days, Massachusetts (Wilder 1917), 5 to 8 weeks (Bishop 1941:318), about 10 weeks (Babbitt 1937:16).

Larval Period: 7 to 10 months, usually transform in June (Wilder 1913:295). From 9 to 12 months in Maryland (Danstedt 1975).

Home Range/Movement: Less than 10 ft (3 m) along a stream in a wooded ravine in Pennsylvania (Bartholomew and Bellis 1969). Average range of 1.4 m² in a gravel bottom stream in Ohio (Ashton and Ashton 1978). Average about 150 ft² (14 m²) along a stream in Kentucky, maximum movement of 100 ft (30.5 m) as open water dried up (Barbour 1971:57). Average weekly movement less than 0.5 m (Ashton 1975). In an intermittent mountain stream average for 5 individuals was 48 m², daily movements less than 2 m (Barbour et al. 1969b).

Food Habits/Preferences: Small aquatic and terrestrial invertebrates, insects--96% of prey by weight (Burton 1976), grubs, worms, crustaceans, spiders, and occasionally mollusks; sometimes larvae of own species. Nocturnal feeder, also active on cloudy or rainy days.

Comments: Larval stage is aquatic, adults are riparian.

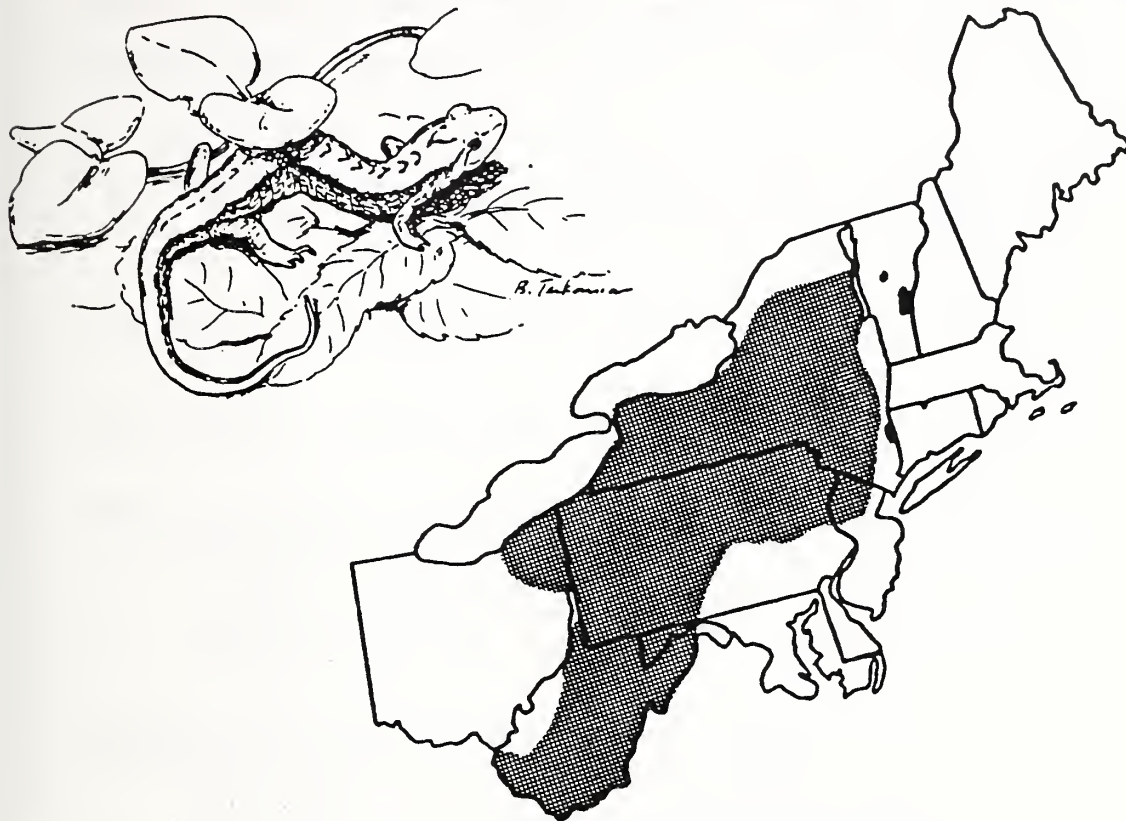
Selected References: Bishop 1947, Organ 1961, Ashton 1975.

Mountain Dusky Salamander

Desmognathus ochrophaeus

Caudata

Plethodontidae



Range: Appalachian mountains and uplands from New York to n. Georgia at altitudes ranging from a few hundred feet (approx. 60 m) above sea level to timberline in the s. Appalachians.

Relative Abundance in the Northeast: Common in appropriate habitats, but habitats are restricted.

Habitat in the Northeast: Semi-terrestrial, found along stream edges and on the forest floor. In wet woods under forest debris, logs, stones, sometimes beneath the bark of dead trees. Near water--small streams, springs or seeps. Seeps and springs used for late autumn and winter hibernation. Individuals inhabiting seepage banks are active earlier in spring and later in the fall than streamside individuals (Keen 1979).

Special Habitat Requirements: Seeps, springs or streams in woodland areas.

Age/Size at Sexual Maturity: About 3 years: females at 36 months deposit clutch at 30 to 34 mm snout-vent length (Keen and Orr 1980).

Breeding Period: Spring, autumn or winter (Fitzpatrick 1973).

Egg Deposition: Annual cycle occurring in late winter/spring or autumn, female guards eggs.

No. Eggs/Mass: 11 to 14 eggs (Bishop 1941:335). Stalked eggs deposited in clusters underneath stones or logs in small cavities. Fecundity in *Desmognathus* is size-dependent (Tilley 1968).

Time to Hatching: 50 to 70 days (Tilley 1972), hatching in fall and early spring.

Larval Period: 2 to 8 months (Tilley 1970); in the s. Appalachians, larvae occasionally overwinter (Tilley 1973:129.1).

Home Range/Movement: Average movement of 40 to 45 cm between captures of displaced and nondisplaced individuals in a rock-face habitat in North Carolina (Huheey and Brandon 1973). Homing to the nest shown by breeding females (Forester 1979). Females are philopatric, ovipositing in the same section of a stream in successive years (Forester 1977).

Food Habits/Preferences: Insects, including adult and larval forms of flies, beetles, wasps and ants. Oligochaetes (Keen 1978), also takes other small arthropods (Huheey and Brandon 1973). Eats shed skin (Bishop 1941:341), suggesting that this species does not actively forage but eats only nearby prey (Keen 1979).

Comments: Basically nocturnal but also active on dark humid days. Will climb trees and shrubs to feed.

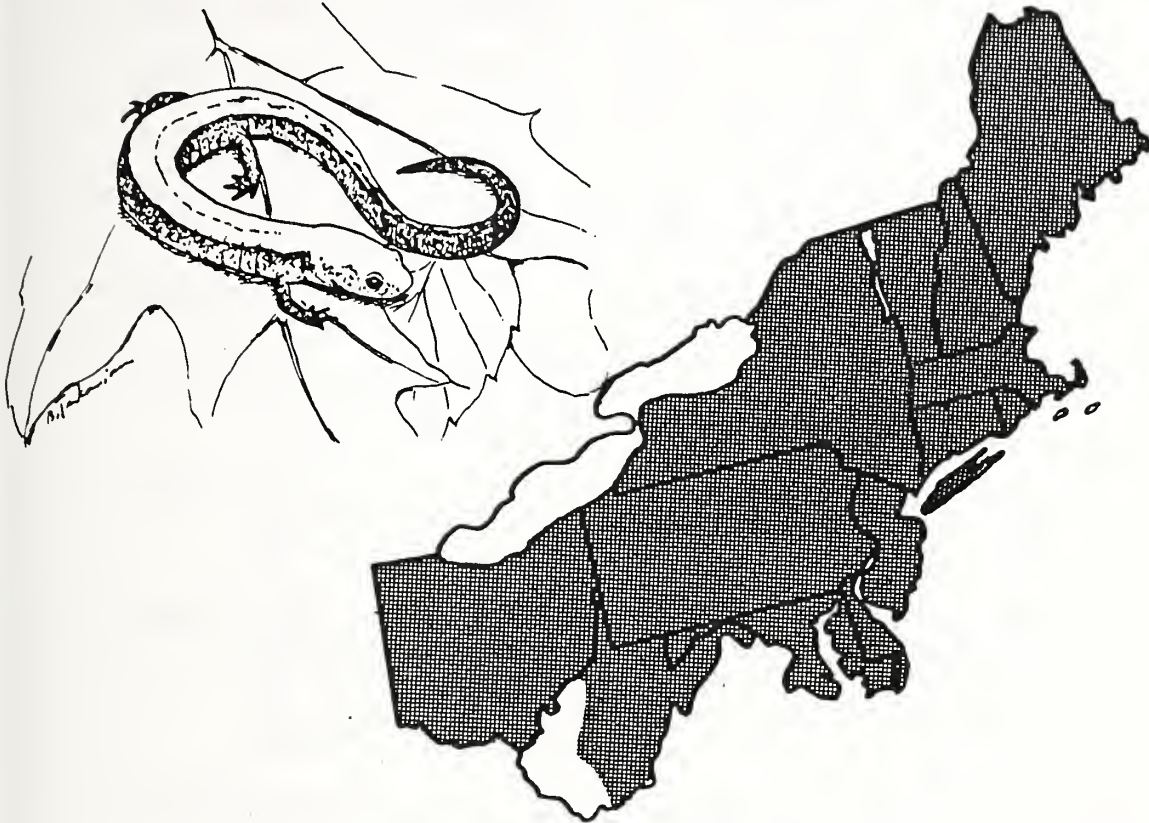
Selected References: Bishop 1947, Hairston 1949, Huheey and Brandon 1973, Tilley 1973.

Redback Salamander

Plethodon cinereus

Caudata

Plethodontidae



Range: Nova Scotia west to s. Ontario and e. Minnesota, south in scattered colonies to Missouri, in the Smoky Mountains, in s. Tennessee and east to Cape Hatteras.

Relative Abundance in the Northeast: Abundant.

Habitat in the Northeast: Entirely terrestrial. Mixed deciduous or coniferous woods, inhabiting interiors of decaying logs and stumps, also found underneath stones, moist leaf litter and bark. Wet areas and extremely moist bottomland avoided. Enters xeric, sandy habitats where moist micro-habitats exist (M. Klemens, pers. commun.).

Hibernates down to 15 in (38 cm) soil depth (Oliver 1955:121) or in rock crevices. May be active during mild winter weather (Minton 1972:67). In Indiana, individuals were found active in an ant mound throughout the winter (Caldwell 1975). Found hibernating 30 to 36 in (76.2 to 91.4 cm) depth in decaying root systems of dead white oaks in s.e. Massachusetts (Hoff 1977). Has been found hibernating in aquatic situations in Maryland (Cooper 1956).

Redback Salamander

Special Habitat Requirements: Logs, stumps, rocks, etc.

Age/Size at Sexual Maturity: Generally during second year (Oliver 1955:277), but female usually reproduces in third year (Burger 1935).

Breeding Period: Biannual cycle, spring and late fall (October through December) in Maryland (Sayler 1966).

Egg Deposition: June to July of next year.

No. Eggs/Mass: 3 to 14 eggs, average 7 to 10, in small clusters attached to roof of small chamber, laid in and under rotted logs and stumps. Reproduce annually in Connecticut (Lotter 1978).

Time to Hatching: 30 to 60 days (Oliver 1955:234), extending 84 days in Maine (Banasiak 1974). Hatch in August to September. Larval stage is completed within egg.

Home Range/Movement: Home range is small due to restricted horizontal movements (Taub 1961). Movement of less than 1 ft (30.5 cm) for 14 individuals in hardwood forest habitat in New Jersey; individuals usually found under the same object where initially captured (Taub 1961).

Food Habits/Preferences: Small insects and their larvae, earthworms, snails, slugs, spiders, sowbugs, millipedes, mites (Surface 1913:95). Occasionally cannibalistic. Mites were the most important food, comprising 65% of the prey items in a New Hampshire study (Burton 1976), insects 73% by weight in a New York study (Jameson 1944). During rainy summer nights found on leaf litter presumably foraging for food (Burton and Likens 1975). Often climbs tree trunks and shrubs in search of food, particularly during wet nights.

Comments: Three distinct color phases occur, redback, leadback and erocrystic. In Connecticut, the redback morph occurs almost exclusively in cold upland areas; in areas of more moderate climate and elevation, both redback and leadback morphs occur (M. Klemens, pers. commun.). All records of erocrystic individuals occur north of 41° and south of 47° latitude (S. Tilley, pers. commun.). The redback salamander is the most abundant terrestrial vertebrate in New England and comprises the greatest amount of vertebrate biomass in Hubbard Brook Experimental Forest in New Hampshire (Burton and Likens 1975).

Selected References: Heatwole 1962, Smith 1963.

Slimy Salamander

Caudata

Plethodon g. glutinosus

Plethodontidae



Range: Extreme w. Connecticut through c. New York to e. Oklahoma, Arkansas, south in Louisiana to c. Florida. Scattered colonies in S. New Hampshire and Texas.

Relative Abundance in the Northeast: Uncommon to rare.

Habitat in the Northeast: Moist wooded hillsides and ravines. Terrestrial, found underneath moist humus, in crevices in rock, and under logs in woodland areas. Has been found in second-growth oak-hickory forests and steep hemlock slopes of ravines in the Helderberg Mountains, New York (M. Stewart, pers. commun.). Also in mature mixed deciduous forests (Semlitsch 1980a). Hibernates underground from November to March or April.

Special Habitat Requirements: Rock outcroppings, logs within wooded areas.

Age/Size at Sexual Maturity: Females mature at about 4 years and lay eggs in the fifth year, males at 4 years (Highton 1962). Lengths of 59 to 74 mm snout to vent length in females, 53 to 70 mm in males (Highton 1962).

Breeding Period: Autumn and spring (Highton 1956).

Egg Deposition: Probable biennial oviposition occurring either in autumn or late spring in northern populations (Highton 1962). Eggs laid within rock crevices or rotted logs (Smith 1961:58).

No. Eggs/Mass: 13 to 34 eggs, average 16 to 17 (Highton 1962). Eggs aggregated in a thin envelopment. Fecundity increases with body size (Semlitsch 1980a).

Time to Hatching: Probably in late summer; entire larval period spent within egg.

Home Range/Movement: Twenty-two individuals in n. Florida were recaptured at or within 4 ft (1.2 m) of the original capture point (Highton 1956). Adult home ranges less than 9 m diameter, immatures less than 6 m diameter, in oak-hickory forest with thick leaf litter in North Carolina. Mean movement distances were 17.5 m for males, 14.3 m females, and 4.2 m juveniles. Probably capable of movements over 90 m beyond home range area (Wells and Wells 1976).

Food Habits/Preferences: Mostly insects, also sowbugs, worms, centipedes, spiders, slugs and snails (Hamilton 1932). Availability probably governs feeding habits. Ants and beetles were the most abundant food items in a Virginia study, comprising 58% of the total weight of food (Davidson 1956).

Comments: Nocturnal, may be active during some rainy days. During hot, dry spells found deep underground or under logs in dense aggregations (Wells and Wells 1976).

Selected References: Bishop 1941, Highton 1956, 1962.

Four-toed Salamander

Caudata

Hemidactylium scutatum

Plethodontidae



Range: Nova Scotia west to s. Ontario and Wisconsin, south to Alabama and Georgia. Absent from most of northern New England. Scattered disjunct populations occur in the e. U.S.

Relative Abundance in the Northeast: Uncommon to rare.

Habitat in the Northeast: Wet woodlands, preferably with sphagnum moss; shaded, shallow woodland pools; tamarack bogs. Hides in moss, in moist decaying wood, under stones or wet leaves. Prefers an acidic environment. Found in beech/maple, yellow birch/maple and other hardwood forests, found less often in coniferous woods (Neill 1962:2.1). Larval stage is aquatic, found in pools and quiet streams with an abundance of moss. Typically hibernates in decaying root systems of trees.

Special Habitat Requirements: Wet woodlands.

Age/Size at Sexual Maturity: About 2-1/2 years (Barbour 1971:74).

Four-toed Salamander

Breeding Period: Late summer and autumn, peak in fall. Breeding area adjacent to mixed hardwood or northern conifer woods in West Virginia (N. Green, pers. observ.) and Albany County, New York (M. Stewart, pers. commun.).

Egg Deposition: March to April or May (Blanchard 1934, Barbour 1971:73). Nests located next to and just above water.

No. Eggs/Mass: 19 to 50 eggs (Dunn 1926:200, 202), average 50 in New York (Bishop 1941:183). Communal nesting may occur with up to 800 eggs laid per nest. One to four females will remain with eggs (Wood 1953). Eggs laid singly; adhered to moss, roots, decayed leaves.

Time to Hatching: 38 to 60 days (Blanchard 1934).

Larval Period: 6 weeks (Blanchard 1923), 18 weeks; variation in larval development time dependent upon pond conditions (Bishop 1941:186).

Home Range/Movement: Unreported.

Food Habits/Preferences: Small invertebrates, including insects, spiders, earthworms.

Comments: Nocturnal.

Selected References: Bishop 1947, Neill 1963.

Northern Spring Salamander

Caudata

Gyrinophilus p. porphyriticus

Plethodontidae



Range: Through the Appalachian range from w.c. Maine and extreme s. Quebec south to e. Ohio and c. Alabama, Pennsylvania and n. New Jersey. Absent from the Coastal Plain.

Relative Abundance in the Northeast: Uncommon to rare, except in Vermont and n.w. Berkshire County, Massachusetts where common (T. Tynning, pers. commun.).

Habitat in the Northeast: Found in forested areas with clear, cold water, mountain streams, boggy areas. Also in depressions under stones or other cover adjacent to water. Usually occurs at higher elevations in spruce-fir forests, typically in moist situations, in underground water courses and limestone caves (N. Green, pers. observ.), beech-maple-hemlock forests, in shale ravine streams in Tompkins and Albany Counties, New York and in spring seepages in the Adirondacks (M. Stewart, pers. commun.).

Special Habitat Requirements: Streams, seeps or springs. In winter, wet soil near water where remains somewhat active in burrows.

Northern Spring Salamander

Age/Size at Sexual Maturity: 4 to 5 years, at total length of about 5-1/2 in (14 cm) in New York (Bishop 1947:370).

Breeding Period: Mid-October to winter months (Bruce 1972). Annual reproduction cycle (Bruce 1969).

Egg Deposition: April to summer and into the fall (Bruce 1972), female guards eggs (Organ 1961).

No. Eggs/Mass: 9 to 63 (Bruce 1972), 44 to 132 eggs (Bishop 1941:247), 44 to 66 (Organ 1961). Eggs laid in running water under logs and stones, usually in groups, sometimes attached singly.

Time to Hatching: Fall (Organ 1961). Hatch late summer, early fall. The young from one clutch may remain near the nest site for several months after hatching (Bruce 1980).

Larval Period: Variable larval period, average of about 4 years. Metamorphosis occurs in late spring and summer (Bruce 1980). Larvae are aquatic.

Home Range/Movement: Unreported.

Food Habits/Preferences: Euryphagic predators--consume aquatic insects and their nymph and larval forms, crustaceans, centipedes, earthworms, snails, spiders, millipedes, small frogs and salamanders. Terrestrial insects were 79% of total prey items in New Hampshire (Burton 1976). Has been found to eat its own larvae (Logier 1952:76). Salamanders comprise 50% of the diet in the Appalachians (Bruce 1972); salamanders a minor part of diet in New York (Bishop 1941:253). Nocturnal, forages for food among rocks and vegetation in or along stream beds on rainy summer nights. Larvae are generalist feeders until metamorphosis when they take larger food items (Bruce 1980).

Comments: Formerly named the purple salamander.

Selected References: Bishop 1941, Brandon 1967, Bruce 1972, 1980.

Northern Red Salamander

Caudata

Pseudotriton r. ruber

Plethodontidae



Range: Southern New York to e. Ohio, south to n.e. Mississippi, c. Alabama, Georgia and South Carolina. Disjunct colonies along the Ohio River.

Relative Abundance in the Northeast: Uncommon, abundant south into Maryland and Pennsylvania.

Habitat in the Northeast: Near meadow and woodland streams, springs, swamps, and trickles with cool clear water. Terrestrial habitats include shallow burrows under moss, stones or other debris often far from water. Prefers streams with abundant leaf litter and gravel, sand or rock bottoms. Avoids large swift streams (Martof 1975:167.1). Terrestrial surface dweller in early spring and summer and found in aquatic habitats from late summer through to next spring (Bruce 1978).

Special Habitat Requirements: Aquatic habitats used during winter and for breeding.

Age/Size at Sexual Maturity: Males reach sexual maturity during fourth summer at 45 months, females oviposit at 5 years or older (Bruce 1978).

Northern Red Salamander

Breeding Period: Late June to September (Bruce 1978).

Egg Deposition: Fall months at onset of cooler temperatures. Females with eggs have been found in December, February and April.

No. Eggs/Mass: 50 to 100 eggs (Martof 1975:167.1). Clutch size varies with body size. Eggs laid under submerged stones attached separately or in small clusters. Different females may lay eggs under the same stone. Clusters contain 12 or more eggs (Dunn 1926:277).

Time to Hatching: 58 to 74 days (Bishop 1941:266).

Eggs Hatch: Late fall to December (Dunn 1926:277).

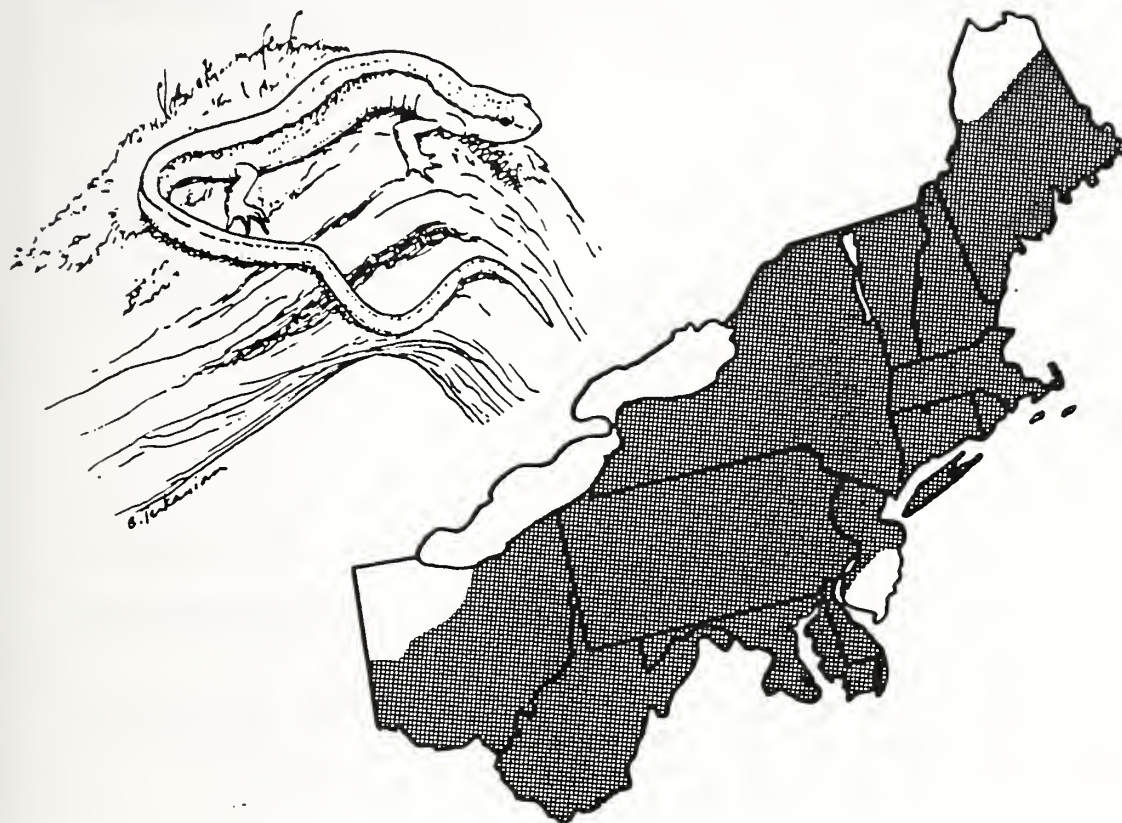
Larval Period: About 30 months (Bishop 1925) to 3 years (Babbitt 1937:71), 27 to 31 months, slightly shorter in northern parts of range (Martof 1975:167.1). Larvae inhabit still waters of springs and small streams (Martof 1975:167.1).

Home Range/Movement: Unreported.

Food Habits/Preferences: Earthworms, snails, slugs, spiders, millipedes, water fleas, insects and their larvae, other salamanders (Surface 1913:103). Feed in patches of water weeds. Larval stage feeds on insect larvae, worms and water fleas (Bishop 1925:397).

Comments: During summer months may be found a considerable distance from water.

Selected References: Bishop 1943, 1947; Bruce 1968; Martof 1975.



Range: Gaspé Peninsula, Quebec and e. Ontario southwest through Ohio to e. Illinois, south to extreme n.e. Mississippi to Virginia.

Relative Abundance in the Northeast: Common to abundant.

Habitat in the Northeast: Floodplain bottoms to moist forest floors at high elevations to 1,829 m (6000 ft) (Behler and King 1979:321). Along brooks and streams, boggy areas near springs or seeps. Found under objects at waters' edge in moist soil or in coarse sand and gravel at stream bottoms or edges, leaf litter and crayfish burrows (Ashton and Ashton 1978). In wet woodlands or pastures. Found at considerable distances from water if cover objects are available (M. Stewart, pers. commun.). During wet or humid weather will wander from water courses into moist woods.

Hibernates under water, or remains active in feeding aggregations in springs and cold, flowing streams in New York (Stewart 1956a) and adjacent unfrozen soil (Ashton and Ashton 1978).

Special Habitat Requirements: Streams for breeding.

Age/Size at Sexual Maturity: The majority mature during the second fall after metamorphosis (Stewart 1956a).

Breeding Period: Autumn and early spring. Breeds in streams with high pH.

Egg Deposition: May to early June, Massachusetts (Johnston and Goldberg 1975).

No. Eggs/Mass: 12 to 36 eggs, average of 18 eggs in Massachusetts (Wilder 1924). Eggs deposited in clusters attached to bottoms of stones or logs in running water. Several females may use the same stone as a nest site, one female remains with eggs until hatching.

Time to Hatching: 1 to 2 months after eggs laid.

Larval Period: 2 or 3 years, aquatic (Wilder 1924).

Home Range/Movement: Average area less than 14 m² for 20 monitored individuals along a stream in Ohio (Ashton and Ashton 1978).

Food Habits/Preferences: Insects, particularly beetles, beetle larvae, mayflies, stonefly nymphs and dipterans; also spiders, mites, millipedes, sowbugs and earthworms (Hamilton 1932). Most prey are of terrestrial origin (Burton 1976).

Comments: Will travel in the open during wet or rainy nights, rarely during wet days. Adults are extremely agile and when disturbed often escape through a series of rapid jumps.

Selected References: Bishop 1941, Bleakney 1958, Mittleman 1966.

Longtail Salamander

Eurycea l. longicauda

Caudata

Plethodontidae



Range: Southeastern New York through c. Indiana to n. Alabama and n. Virginia. Absent from the Delmarva Peninsula and s. New Jersey.

Relative Abundance in the Northeast: Unreported.

Habitat in the Northeast: Usually associated with rocky streams and seeps in moist forested areas; frequently found in caves. Under and in decaying wood, under stones or in shale banks and rocky outcroppings. Adults occur in damp wooded areas and streamside situations.

Special Habitat Requirements: Requires mesic terrestrial conditions.

Age/Size at Sexual Maturity: Females reach maturity in 3 years, at 46 to 52 mm snout-vent length. Males sexually mature at 43 mm, at end of second summer in n. New Jersey (Anderson and Martino 1966).

Breeding Period: Probably late fall or winter (Anderson and Martino 1966). Breeds in streams and seepages.

Longtail Salamander

Egg Deposition: In New Jersey eggs laid underground from January to February (Anderson and Martino 1966). Females have been found with eggs in September in Indiana (Minton 1972:79), November in Maryland (Franz 1964), January in Pennsylvania (Mohr 1943, cited in Minton 1972:79).

No. Eggs/Mass: About 100 eggs (Minton 1972:79). Eggs attached to the underside of submerged stones or suspended above water.

Larval Period: Averages 90 to 100 days with metamorphosis occurring in mid-June in New Jersey (Anderson and Martino 1966). Larvae are aquatic.

Home Range/Movement: Unreported.

Food Habits/Preferences: Insects, especially coleopteran larvae; also spiders, mites, ticks, pseudoscorpions and some vegetative material. Less frequently takes centipedes, millipedes, earthworms and isopods (Anderson and Martino 1967).

Comments: Nocturnal but also active on rainy days. In limestone areas of n. New Jersey, this species is the last salamander to emerge in the spring--commonly found in mid-April (Anderson and Martino 1966). Life history details are not well known.

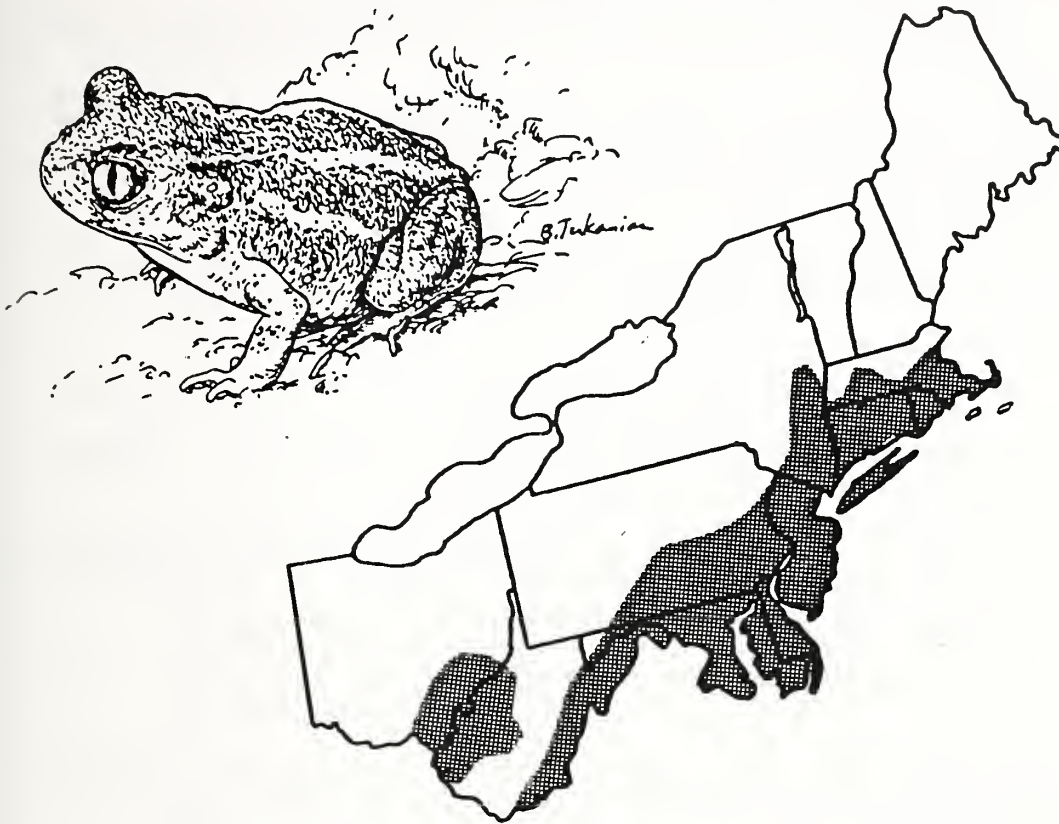
Selected References: Bishop 1941, 1947; Anderson and Martino 1966.

Eastern Spadefoot

Anura

Scaphiopus h. holbrooki

Pelobatidae



Range: Southeastern Massachusetts extending to New York and s.e. Missouri, south to e. Louisiana and Florida. Not found in the higher elevations of the Appalachians or the Everglades of Florida.

Relative Abundance in the Northeast: Rare, common south into New Jersey, Maryland and Delaware.

Habitat in the Northeast: In dry sandy or loose soils in sparse shrub growth or open forest areas. Terrestrial and subterranean, only enters water to breed, usually in temporary rain pools. Prefers forest areas with leaf litter (Pearson 1955). In oak-hickory Savannah in Oklahoma, in farmland areas in Connecticut River Valley, Massachusetts and pitch-pine scrub oak dunes in New York (Stewart and Rossi, unpubl. ms.). Colonies occur along floodplains or major rivers. Emerge in spring from hibernation when soil moisture is sufficient.

Special Habitat Requirements: Sandy soils, temporary pools for breeding.

Age/Size at Sexual Maturity: During second year after metamorphosis, males at 15 months, females at 19 months (Pearson 1955).

Breeding Period and Egg Deposition: Usually April or May, extending into August; breeding is initiated by a heavy rainfall (Gosner and Black 1955). Breeds in congregations of many individuals if population is high. Usually a one-night phenomenon.

No. Eggs/Mass: 1,000 to 2,500 eggs in masses of 6 to 110 in irregular bands in or around plants of temporary water. Eggs are very adhesive.

Time to Hatching: 5 to 15 days (Oliver 1955:236).

Tadpoles: Late broods transform in 16 to 20 days (Gosner and Black 1955), 48 to 63 days for early broods (Driver 1936).

Home Range/Movement: Mean home range about 10 m² (108 ft²) in n. Florida, for 90% of captures average home range was about 6.2 m² (67 ft²). Occupy one or several underground burrows within home range (Pearson 1955). Maximum dispersal distances of 9.8 m (32 ft); individuals were recaptured in the same home ranges after 5 years (Pearson 1957).

Food Habits/Preferences: Flies, spiders, crickets, caterpillars, true bugs, other ground-dwelling arthropods, earthworms and snails. Moths are eaten when they can be caught (Bragg 1956:36). Tadpoles are planktonic feeders for the first few days (Richmond 1947), later becoming carnivorous and sometimes even cannibalistic.

Comments: Nocturnal, peaks of activity occur just after sundown and before sunrise. Fossorial; individuals have remained in burrows an average of 9.5 days at a time, emerging to feed (Pearson 1955). Can remain underground for weeks or months during dry periods. As evidence of the spadefoot's secretive and nocturnal habits, there was a total of 16 reported sightings from 1811 to 1936 in the n.e. part of its range (Ball 1936, cited in Bragg 1965:51).

Selected References: Ball 1936, Pearson 1955, Bragg 1965, Wasserman 1968.

American Toad

Anura

Bufo a. americanus

Bufonidae



Range: Nova Scotia and the Gaspé Peninsula west through c. Ontario to Lake Winnipeg, south to e. Kansas, c. Indiana, c. Alabama and c. North Carolina.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Found in almost any habitat: gardens, woods, yards with cover, damp soil and a food supply. Sea level to mountain elevations. Usually in moist upland woods.

Special Habitat Requirements: Needs shallow water for breeding. Hibernates in burrows underground to 12 in (30.5 cm) deep (Oliver 1955:122) from October to late March or April.

Age/Size at Sexual Maturity: 3 to 4 years (Dickerson 1969:72), 2 to 3 years (Hamilton 1934).

Breeding Period and Egg Deposition: Early April to July, peak in late April in the Northeast. Travels to breeding ponds at night in large numbers (Maynard 1934).

American Toad

No. Eggs/Mass: 4,000 to 12,000 eggs (Dickerson 1969:67). Laid in long curling strings amidst aquatic vegetation.

Time to Hatching: About 3 to 12 (average 4) days.

Tadpoles: 5 to 10 weeks.

Home Range/Movement: Exhibits homing behavior by returning to breeding sites; 264 individuals used the same site annually in Ontario (Oldham 1966).

Food Habits/Preferences: Terrestrial arthropods, including insects, sowbugs, spiders, centipedes and millipedes. Slugs and earthworms are other invertebrate foods. Some vegetable matter is taken accidentally. Food species determined by availability (Hamilton 1954). Feeds from twilight through the evening hours.

Comments: Most active during evening hours. May bask (M. Stewart, L. White, pers. observ.), but will seek cover during the heat of the day. Calls and breeds during the day at the peak of breeding season (T. Tynning, pers. commun.).

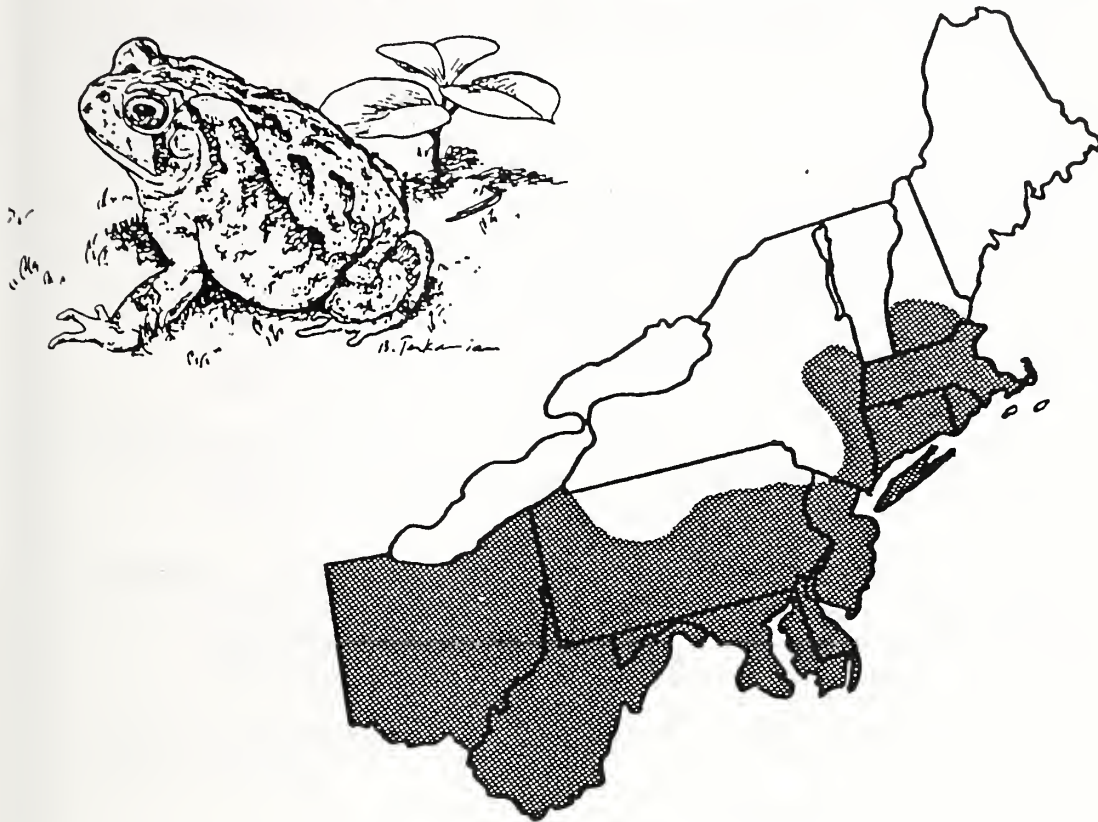
Selected References: Wright and Wright 1949, Hamilton 1954.

Fowler's Toad

Anura

Bufo woodhousei fowleri

Bufo



Range: Southern New England west to c. Pennsylvania, the n. shore of Lake Erie and e. shore of Lake Michigan south to Missouri, e. Oklahoma, Texas, c. Georgia and South Carolina.

Relative Abundance in the Northeast: Uncommon but locally abundant.

Habitat in the Northeast: Prefers areas with sandy soil--shorelines, river valleys, beaches and roadside areas. Usually found in lowland areas, but frequently in pine and oak forests, gardens, lawns and fields. Hibernates in burrows to 3 ft (0.9 m) deep from early fall to late spring (May in Connecticut).

Special Habitat Requirements: Sandy soils, shallow water for breeding.

Age/Size at Sexual Maturity: Probably breeds during third year (Stille 1952).

Breeding Period and Egg Deposition: Late April to May extending to mid-August (2 to 4 weeks later than *Bufo a. americanus*). Shallow water of pools, lake margins, ditches, etc. necessary for breeding.

Fowler's Toad

No. Eggs/Mass: Up to 8,000 eggs laid in long strings in aquatic vegetation (Wright and Wright 1949:212).

Time to Hatching: About 1 week.

Tadpoles: 40 to 60 days, usually transform mid-summer.

Home Range/Movement: Average distances between captures ranged from 22 to 32 m during a 3-year period on a golf course in Connecticut (Clarke 1974). Night movements of 200 to 700 ft (61 to 213 m) or more to reach waters' edge (Lake Michigan). Toads usually found within 100 ft (30.5 m) of previous capture point (Stille 1952).

Food Habits/Preferences: Chiefly ground-dwelling insects, particularly ants and beetles; also consumes earthworms, spiders, snails and slugs.

Comments: During evening hours may move to edge of water to replenish body moisture (Stille 1952). May be active during the day, but typically crepuscular (Minton 1972:95). Activity periods vary with populations, mostly nocturnal in Connecticut (Clarke 1974).

Selected References: Wright and Wright 1949, Logier 1954, Clarke 1974.

Northern Cricket Frog

Anura

Acris c. crepitans

Hylidae



Range: Southern New York and Long Island through s.e. Pennsylvania, Tennessee and s. Arkansas to e. Texas, east through the Florida panhandle to n.e. North Carolina.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Shallow water with abundant shoreline weeds or aquatic vegetation, preferably in strong sun. Prefers algae-filled water courses (N. B. Green, pers. observ.). Also occurs on sand bars, in swamps, and at the shores of meandering, slow-moving streams; avoids deep water. Semi-hibernates from November to mid-March under stones and leaves at waters' edge. Active on warm days.

Special Habitat Requirements: Emergent or shoreline vegetation in full sun.

Age/Size at Sexual Maturity: Breeds in second spring (Burkett 1969).

Breeding Period and Egg Deposition: April to July.

No. Eggs/Mass: 250 eggs (Smith 1956:89), attached to aquatic vegetation in small masses of about 6 eggs.

Northern Cricket Frog

Time to Hatching: 4 days, longer in cold temperatures.

Tadpoles: 50 to 90 days (Cochran 1961:114), transform late July to September (Logier 1952:90).

Home Range/Movement: Unreported.

Food Habits/Preferences: Insects comprise 75% of prey items, particularly aquatic beetle larvae, midges, muscoid flies and springtails; spiders 25% (Jameson 1947)*.

Comments: Non-arboreal and diurnal. May move between pools at night.

Selected References: Wright and Wright 1949, Logier 1952, Burkett 1969.

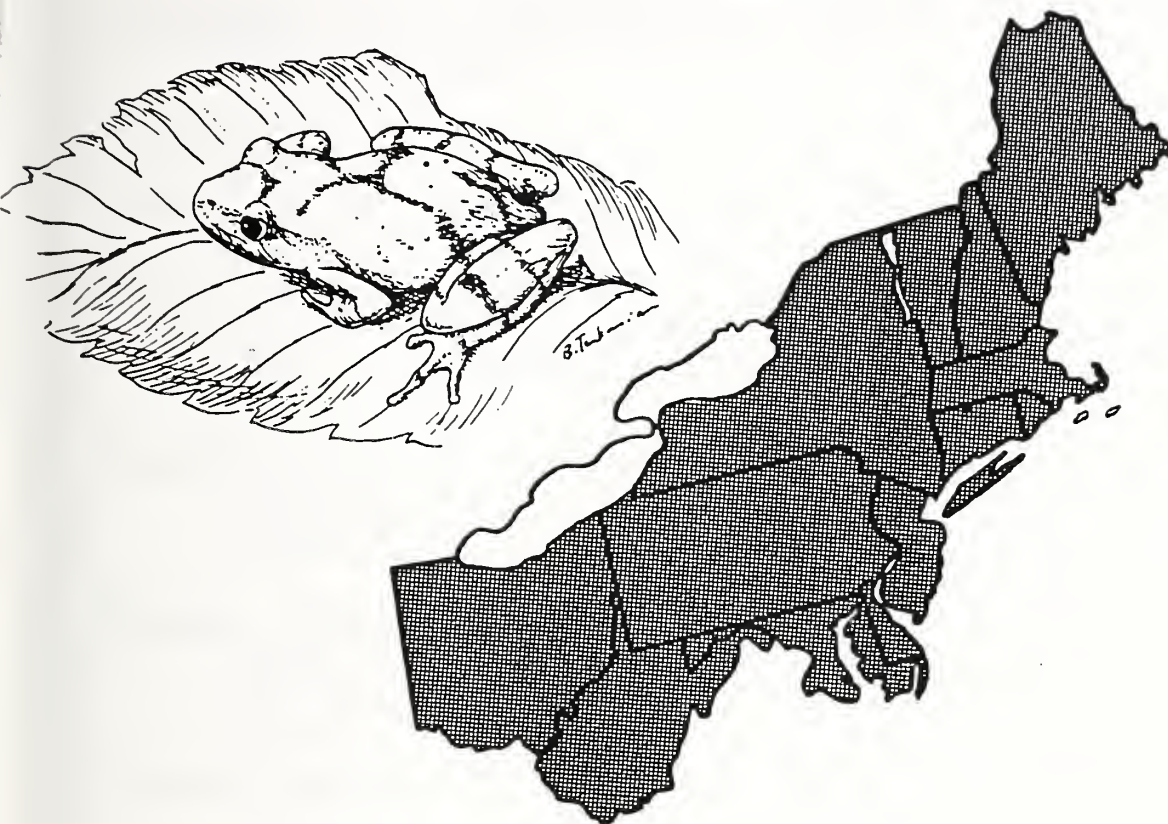
**Acris crepitans* in e. Kansas.

Northern Spring Peeper

Anura

Hyla c. crucifer

Hylidae



Range: Nova Scotia, the Gaspé Peninsula and Quebec to the s. tip of Hudson Bay through Ontario to Lake Winnipeg, south to e. Texas and throughout the e. U.S. except Florida and s. Georgia.

Relative Abundance in the Northeast: Common to abundant.

Habitat in the Northeast: Marshy or wet woods, second growth woodlots, sphagnum bogs, non-wooded lowlands, near ponds and swamps. Found on the ground or burrowed into the soil. Breeds in permanent or temporary water, usually woodland ponds with aquatic debris. Found in cool moist woods after breeding (M. Stewart, pers. observ.). Hibernates on land during late November to January or early spring, under moss and leaves.

Special Habitat Requirements: Pools for breeding.

Age/Size at Sexual Maturity: Early in second year at about 20 mm (Delzell 1958).

Breeding Period and Egg Deposition: Early March to June (in the North).

No. Eggs/Mass: 800 to 1,000 eggs (Wright 1914:16). Laid singly near the bottom of shallow weedy ponds, attached to submerged plants (Oliver 1955:236).

Time to Hatching: 6 to 12 days.

Tadpoles: 90 to 100 days (Wright 1914:42). Usually transform during July (Wright and Wright 1949:314).

Home Range/Movement: In s.e. Michigan, home range diameters ranged from 4 to 18 ft (1.2 to 5.5 m), established around forest debris and vegetation; average daily travel was 20 to 130 ft (6.1 to 39.6 m) reported by Delzell (1958).

Food Habits/Preferences: Small non-aquatic insects: preferably ants, flying bugs, beetles, flies, springtails and spiders, also mites, ticks and small snails. Foods taken probably reflect availability, catchability and size, rather than preference (Oplinger 1967).

Comments: Young frogs terrestrial in first year (Delzell 1958). May move long distances from breeding areas in summer and fall, single calls heard from woods, shrubby openings, far from water (M. Stewart, pers. observ.).

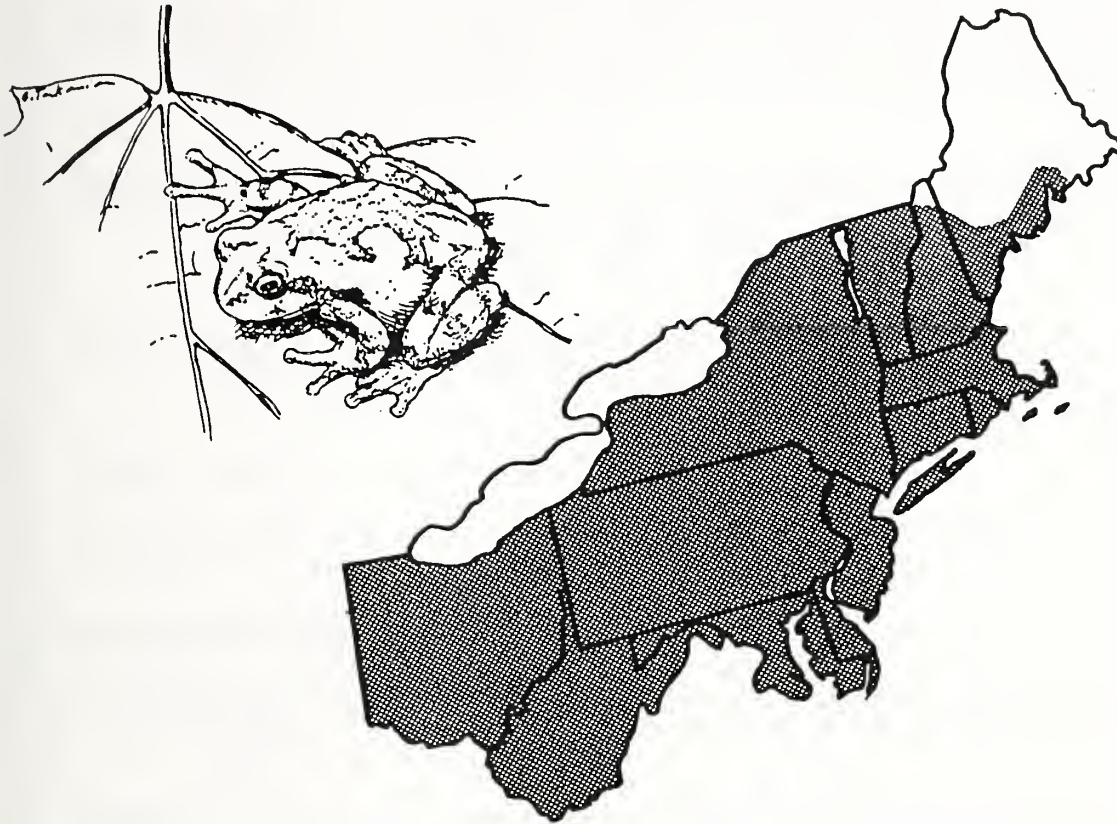
Selected References: Wright and Wright 1949, Logier 1952, Delzell 1958.

Greater and Lesser Gray Treefrog

Anura

Hyla v. versicolor, *Hyla v. chrysoscelis**

Hylidae



Range: Eastern U.S. and s.e. Canada from s. Maine to Manitoba and south through c. Texas and the Gulf States to c. Florida.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Forested regions with small trees, shrubs and bushes near or in shallow water. Often found on moss or lichen on bark of old trees. Will breed in temporary pools or permanent water, swamps, bogs, ponds, weedy lakes and roadside ditches, but breeding sites are extremely variable. Commonly inhabit moist areas in hollow trees, under loose bark, or in rotted logs during summer months (Smith 1961:93).

Special Habitat Requirements: Aquatic sites for breeding.

Age/Size at Sexual Maturity: Undocumented.

*Two species are identical in appearance and can only be positively identified in the field by their voices. Both considered gray treefrogs (Jaslow and Vogt 1977).

Greater and Lesser Gray Treefrog

Breeding Period: Early April to July or August, Maryland (Fellers 1979). May to August (Martof et al. 1980:116). Season varies with latitude (Smith 1961:93). Peak in early May, Ithaca, New York (Wright 1914:44).

Egg Deposition: Generally 20 to 35 days between first appearance and first eggs (Wright 1914:47). April to August, loosely attached to vegetation on the surface of shallow water (Martof et al. 1980:116).

No. Eggs/Mass: Total of 1,800 to 2,000 eggs (Wright 1914:49). Packets of 10 to 40 eggs (Martof et al. 1980:116), or 4 to 25 eggs (Smith 1961:93).

Time to Hatching: 4 to 5 days (Oliver 1955:236).

Tadpoles: 50 to 60 days, shorter periods in warmer areas. Transform late in June to September.

Home Range/Movement: Unreported.

Food Habits/Preferences: Small insects, spiders, plant lice, mites, snails. Forage in vegetation and on the ground (Martof et al. 1980:116).

Comments: Most active during evening hours when vocal both during and out of breeding season. Rarely found outside of breeding period. Able to change color from gray to green. Young are emerald green. Single calls heard occasionally in summer during humid days, often before a storm. *H. versicolor* is a triploid species with 48 chromosomes, *H. chrysoscelis* has 24 chromosomes (Martof et al. 1980:115).

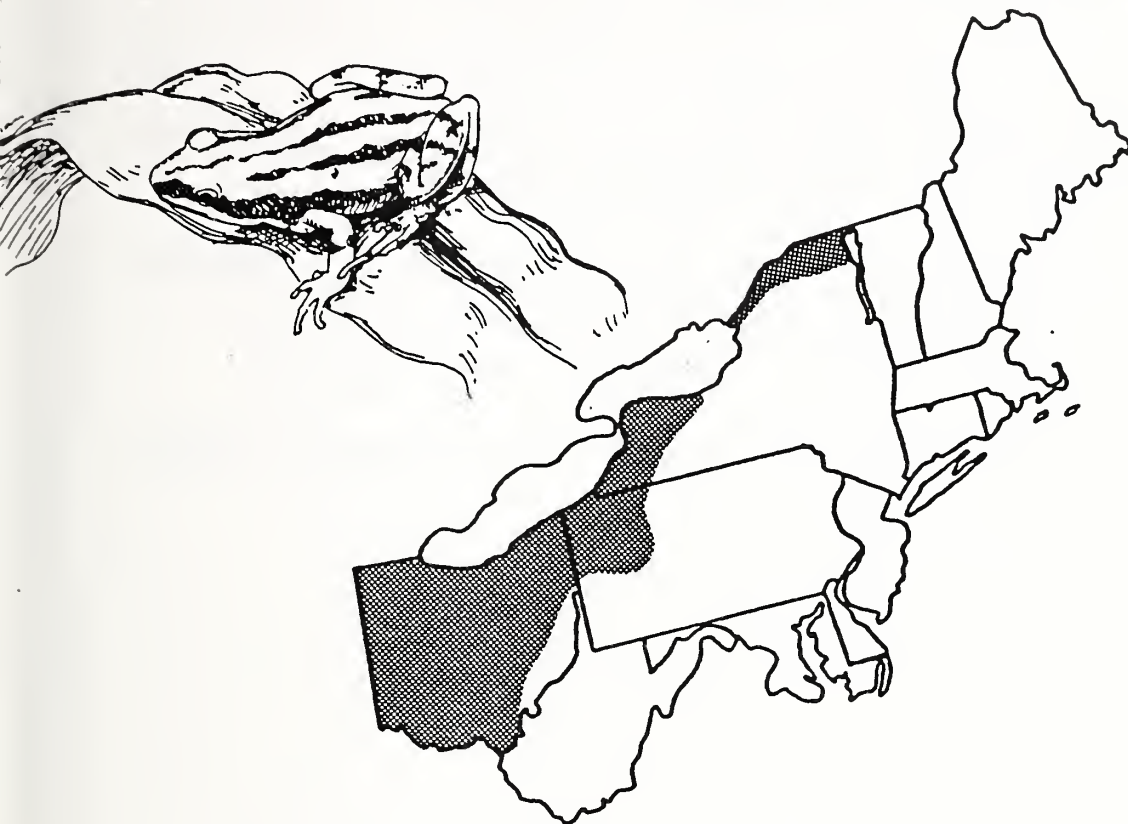
Selected References: Wright and Wright 1949, Logier 1952, Martof et al. 1980.

Western Chorus Frog

Anura

Pseudacris t. triseriata

Hylidae



Range: Extreme s. Quebec and Ontario, n. and w. New York and west through c. Minnesota to w. Nebraska, south to c. Oklahoma, s.w. Ohio and n.w. Pennsylvania. Disjunct populations in Arizona and New Mexico.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Pastures, fields, agricultural lands, swamps, damp meadows in low shrubs and grass. Found within cities and towns in unpolluted areas. Hibernates under forest floor debris or in underground burrows. Has been found up to 10,000 ft (3,048 m) elevations in the Rocky Mountains.

Special Habitat Requirements: Shallow water with emergent vegetation.

Age/Size at Sexual Maturity: Unreported.

Breeding Period: March to June, peak in late March (Illinois, Indiana).

No. Eggs/Mass: 500 to 1,500 eggs, in loose masses of 20 to 100 (Wright and Wright 1949:255).

Time to Hatching: 4 to 10 days (Minton 1972:103).

Tadpoles: 40 to 90 days (Wright and Wright 1949:255).

Home Range Size: For 9 males in a mixed woodland-grassland-farmland habitat in Indiana, home range averaged 2,117 m², and ranged from 641 m² to 6,024 m² (Kramer 1974).

Food Habits/Preferences: Small arthropods, including beetles (adults and larvae), spiders, caterpillars and amphipods are the most common food items. Less frequently, adult moths, leaf hoppers, small flies, wasps, snails and annelids are taken (Minton 1972:104).

Selected References: Wright and Wright 1949, Smith 1961, Minton 1972.

Upland Chorus Frog

Anura

Pseudacris triseriata feriarum

Hylidae



Range: Northern New Jersey and c. Pennsylvania west through Tennessee to e. Texas extending east to the Florida panhandle, c. Georgia and c. parts of the Carolinas. Absent from much of Coastal Plain.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Shallow edges of ponds with mats of vegetation, moss or hummocks; also in marshes, swamps, bogs (Wright and Wright 1949:244). Most breeding ponds are shallow with dense vegetation (N. Green, pers. observ.). Found in cool, damp woods after breeding season (Brimley 1939).

Special Habitat Requirements: Semi-permanent pools for breeding.

Age/Size at Sexual Maturity: Unreported.

Breeding Period: February to mid-May, peak in mid-March.

No. Eggs/Mass: About 1,000 eggs laid in irregular clusters attached to underwater stems (Martof et al. 1980:127).

Upland Chorus Frog

Time to Hatching: A few days.

Tadpoles: 50 to 60 days (Wright and Wright 1949:247).

Home Range/Movement: Unreported.

Food Habits/Preferences: Small arthropods, including insects, millipedes and small crustaceans; slugs are also taken.

Selected References: Wright and Wright 1949, Smith 1961.

New Jersey Chorus Frog

Anura

Pseudacris triseriata kalmi

Hylidae



Range: Staten Island, New York throughout the Coastal Plain to the s. point of the Delmarva Peninsula.

Relative Abundance in the Northeast: Common, in moderate numbers.

Habitat in the Northeast: Freshwater marshes, ditches, open bogs and hardwood swamps are typically used as breeding areas. Oak-hickory, pine-oak woodlands and young fields and meadows are non-breeding habitat in Cape May County, New Jersey (Lomax et al. 1980).

Comments: The life history of this species is poorly known, its biology is presumed to be similar to that of the upland chorus frog.

Selected References: Conant 1975, Lomax et al. 1980.

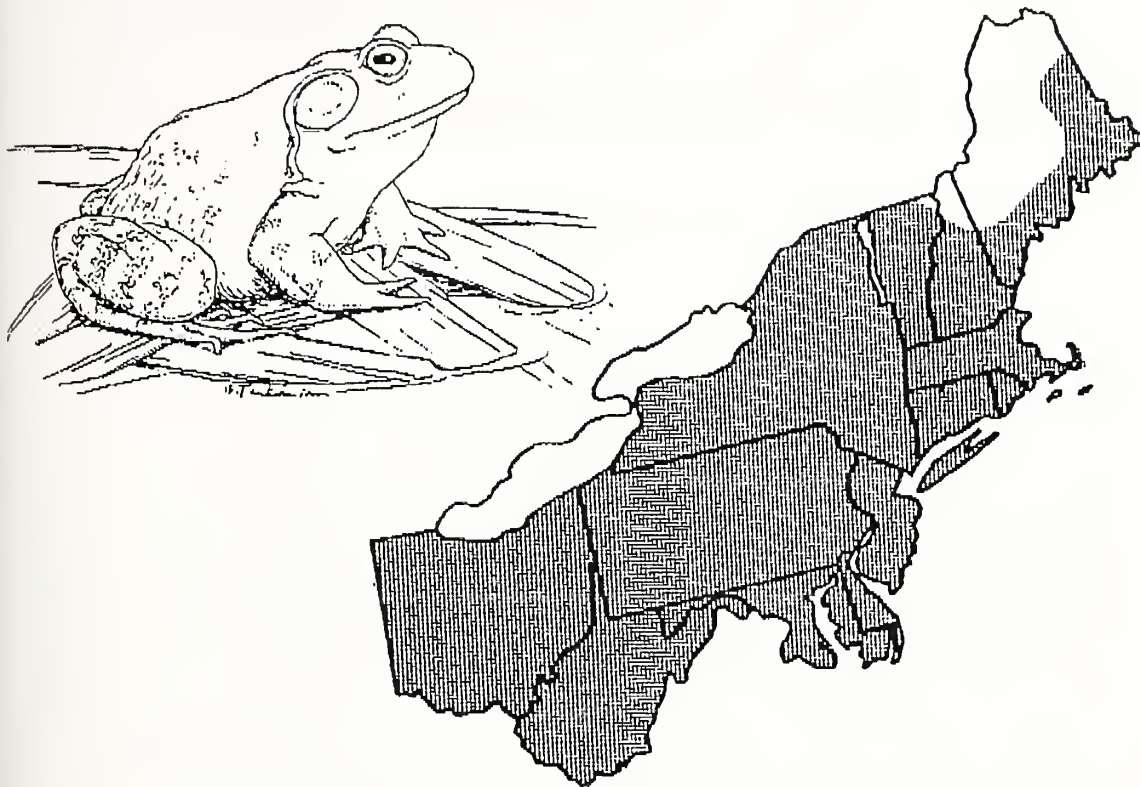


Bullfrog

Anura

Rana catesbeiana

Ranidae



Range: Nova Scotia west to Wisconsin, south through the Great Plains to e. Colorado, Texas and n.e. Mexico; throughout the e. U.S. except s. Florida and parts of n. Maine. Introduced in California and British Columbia.

Relative Abundance in the Northeast: Common, but formerly more abundant.

Habitat in the Northeast: Near shorelines of large bodies of water with emergent vegetation, lakes, river oxbows. Highly aquatic. Tend to remain in same pools for the summer months if water level is stable (Raney 1940). Will occupy floating logs far from shore. Breed close to shore lines in areas sheltered by shrubs (Raney 1940). Hibernates under water in mud and leaves about mid-October, emerges late February to March, May in New York (Wright 1914:78).

Special Habitat Requirements: Deep permanent water and emergent vegetation.

Age/Size at Sexual Maturity: In fourth or fifth year.

Bullfrog

Breeding Period and Egg Deposition: Late May to July (in the North), peak in July.

No. Eggs/Mass: 12,000 to 20,000 eggs (Wright 1914:82). Eggs laid in floating films of jelly in water of lakes, quiet streams and ponds.

Time to Hatching: 5 to 20 days (Oliver 1955:237). Often 4 days or less (Wright 1914:83).

Tadpoles: For 2 to 3 winters.

Home Range/Movement: Average distance traveled in summer, 200 to 300 ft (61 to 91 m) in a woodland lake and pond in New York (Raney 1940, Ingram and Raney 1943). Evening movement of 200 to 700 ft (61 to 213 m) to water in Michigan (Stille 1952). Home range of 131 bullfrogs in an Ontario pond had an average mean activity radius of 8.6 ft (2.6 m) with minimum and maximum movements of 2.0 ft (0.6 m) and 37.1 ft (11.3 m) respectively (Currie and Bellis 1969). Males defend territories during breeding season. In a Michigan study (Emlen 1968), the average distance between males within a chorus was 17.8 ft (5.4 m), implying an average minimum territorial radius of approximately 9 ft (2.7 m).

Food Habits/Preferences: Any available small animals; fish, other frogs, salamanders, newts, young turtles, snakes, small birds, mice, crayfish, insects, snails and spiders. Also cannibalistic. Feeds among the water weeds, an indiscriminate and aggressive predator.

Comments: The bullfrog has become rare in many areas, presumably due to toxic effects of DDT and other pollutants (M. Stewart, pers. commun.).

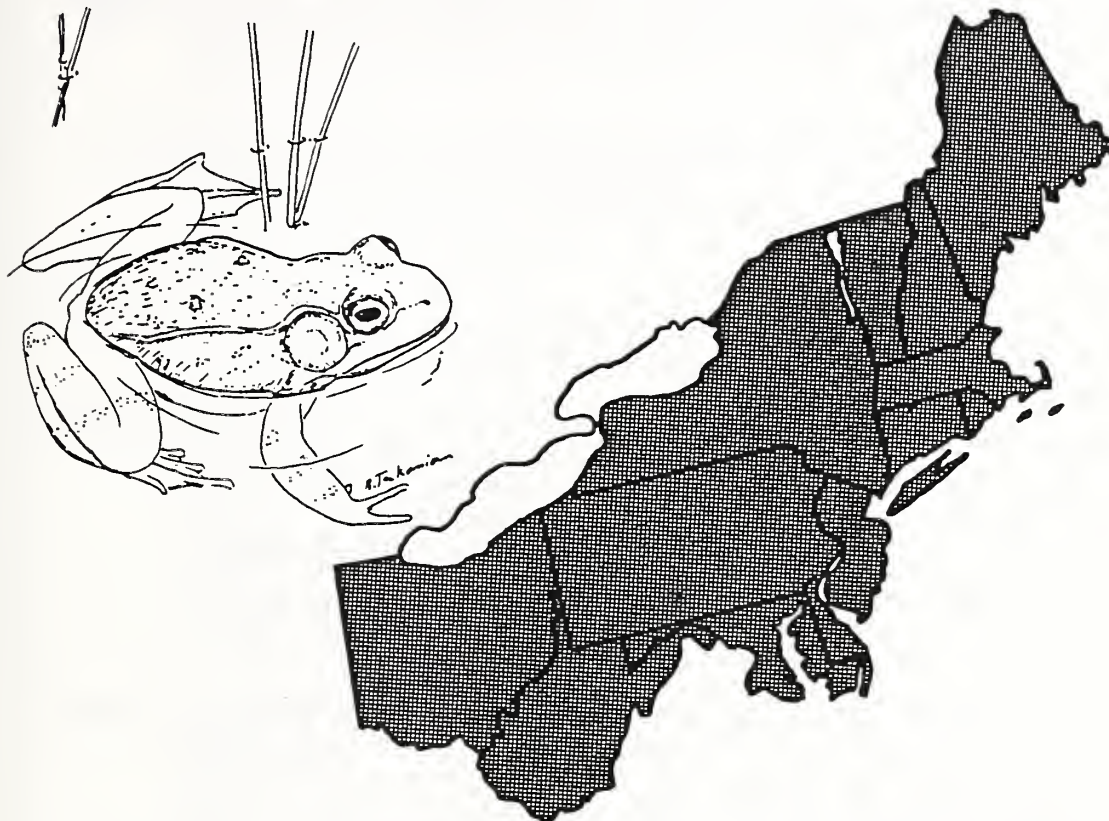
Selected References: Wright and Wright 1949, Logier 1952.

Green Frog

Anura

Rana clamitans melanota

Ranidae



Range: Nova Scotia through Quebec and s. Ontario to c. Minnesota, south to e. Oklahoma and east to n. Georgia and South Carolina. Absent from c. Illinois.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Riparian, inhabits margins of shallow permanent or semi-permanent fresh water, shores and banks of lakes and ponds, creeks, woodland streams, limestone quarry pools, springs, vernal pools, moist woodlands near water. Seldom more than a few meters from the water. Young often found in semi-permanent water. Hibernates underground or underwater from October until March, usually within its home range (Martof 1953b). May be active on warm winter days.

Special Habitat Requirements: Riparian areas.

Age/Size at Sexual Maturity: Males sexually active the season following metamorphosis when 60 to 65 mm long; females mature during the second or third year when 65 to 75 mm long (Martof 1956). Some females reached maturity at 90 mm at Cranberry Lake, New York (M. Stewart, pers. commun.). Some may not breed until the second year after transformation (Wells 1977).

Green Frog

Breeding Period and Egg Deposition: April to August, peak in mid-May, varies with locality. The same female may double-clutch (Wells 1976).

No. Eggs/Mass: 3,500 to 4,000 eggs (Wright 1914:16), to 5,000 (Pope 1944). Eggs deposited in floating masses of jelly in permanent water attached to underwater twigs and stems.

Time to Hatching: Unreported.

Tadpoles: 1 to 2 years. Less than 1 year in southern parts of range . May transform in same season eggs are laid (Martof 1956).

Home Range/Movement: Varied from 20 m² to 200 m² with an average of 61 m² in s. Michigan near a stream and lake; daily movements were less than 10 m for 80% of the 824 individuals recaptured (Martof 1953b). During breeding season, males maintained a 2 to 3 m distance between each other (Martof 1953a). Territory size dependent upon cover density, 1 to 1.5 m between males in areas of dense cover. Territories with diameters of 4 to 6 m defended in open areas in New York (Wells 1977).

Food Habits/Preferences: Terrestrial feeders among shoreline vegetation. Insects and their larvae, worms, small fish, crayfish and other crustaceans, newts, spiders, small frogs and mollusks are taken. Beetles, flies, grasshoppers and caterpillars constituted over 60% of food items (Hamilton 1948). Terrestrial beetles are the most important food item (Stewart and Sandison 1972). Tadpoles are herbivorous.

Comments: Found in or at edge of water during daylight hours; evening hours are spent along the banks feeding or in water defending territories (Wells 1977).

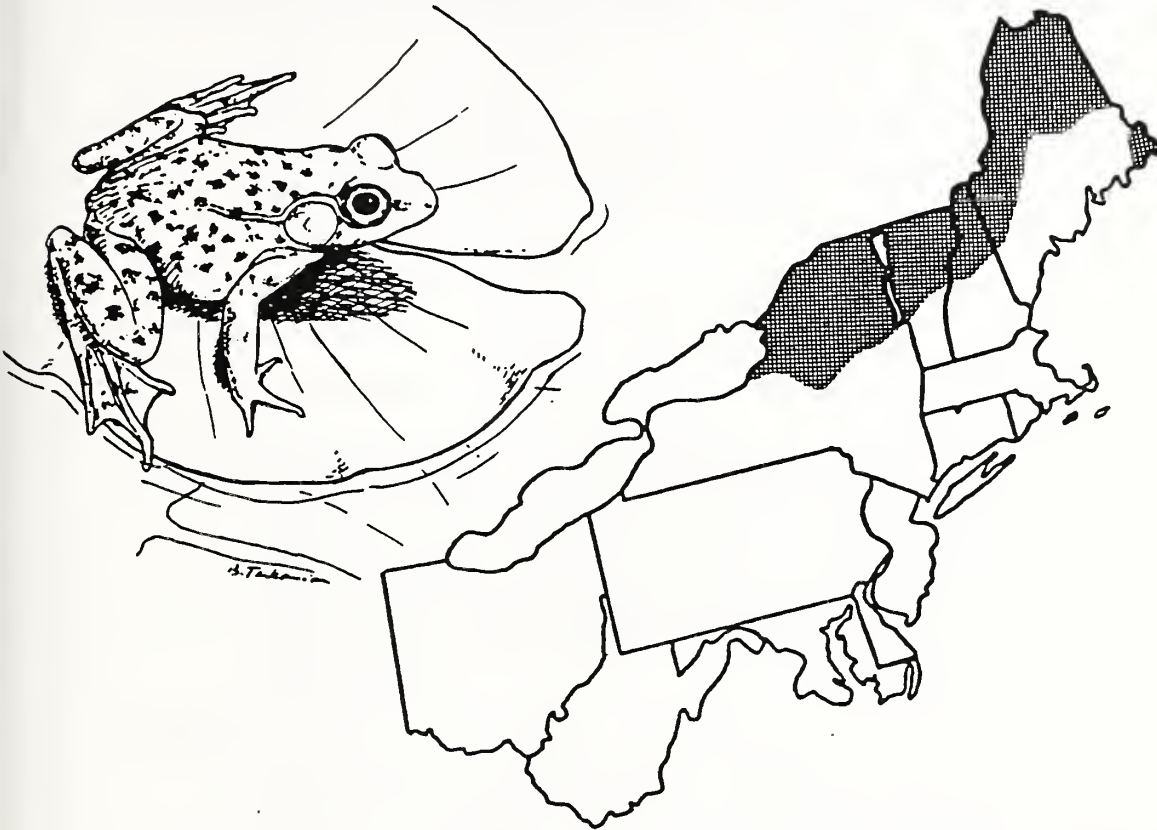
Selected References: Wright and Wright 1949; Logier 1952; Martof 1953b, 1956.

Mink Frog

Anura

Rana septentrionalis

Ranidae



Range: Nova Scotia, n. New England and New York west to n. Wisconsin and Minnesota, north through Ontario to St. James Bay and to n. Quebec and Labrador.

Relative Abundance in the Northeast: Only in extreme northern areas, locally common to rare.

Habitat in the Northeast: At the edges of northern lakes and ponds, cold springs, inlets where cold streams enter ponds and stream edges. Prefers open water with abundant lily pads. Sometimes found in northern bogs.

Special Habitat Requirements: Breeds and hibernates only in permanent waters. Prefers lily pads in open water for basking and foraging (M. Stewart, pers. commun.).

Age/Size at Sexual Maturity: Males 1 year after metamorphosis, females 1 to 2 years after metamorphosis (Hedeen 1972).

Mink Frog

Breeding Period and Egg Deposition: June to early August (Hedeen 1972), peak in July (Wright and Wright 1949:535).

No. Eggs/Mass: One individual laid 509 eggs (Hedeen 1972). Eggs laid in globular jelly-like masses attached to underwater vegetation such as spatterdock (*Nuphar*) then drop to bottom where they develop (M. Stewart, pers. commun.).

Time to Hatching: Unreported.

Tadpoles: For 1 to 2 years. Transform during summer months.

Home Range/Movement: Unreported.

Food Habits/Preferences: Adults feed from lily pads on animal matter, including adult insects and larvae, particularly aphids and chrysomelids (Kramek 1972, 1976), also minnows, millipedes, leeches, snails, spiders; plant material taken inadvertently. Most prey taken from the water surface--usually opportunistic feeders but can be selective (Kramek 1972). Diet is a reflection of prey species availability. Tadpoles feed primarily on algae (Hedeen 1970).

Comments: Very similar to *Rana clamitans* in appearance and habits. Adults produce a musky scent, especially when handled roughly (Conant 1975:342). Competition from green frogs and bullfrogs may be an important factor in habitat selection in the Northeast (M. Stewart, pers. commun.). In ponds treated with rotenone in the Adirondacks the anuran community of green, mink and bullfrogs probably requires 10 to 15 years to recover to pre-treatment levels (Stewart 1975).

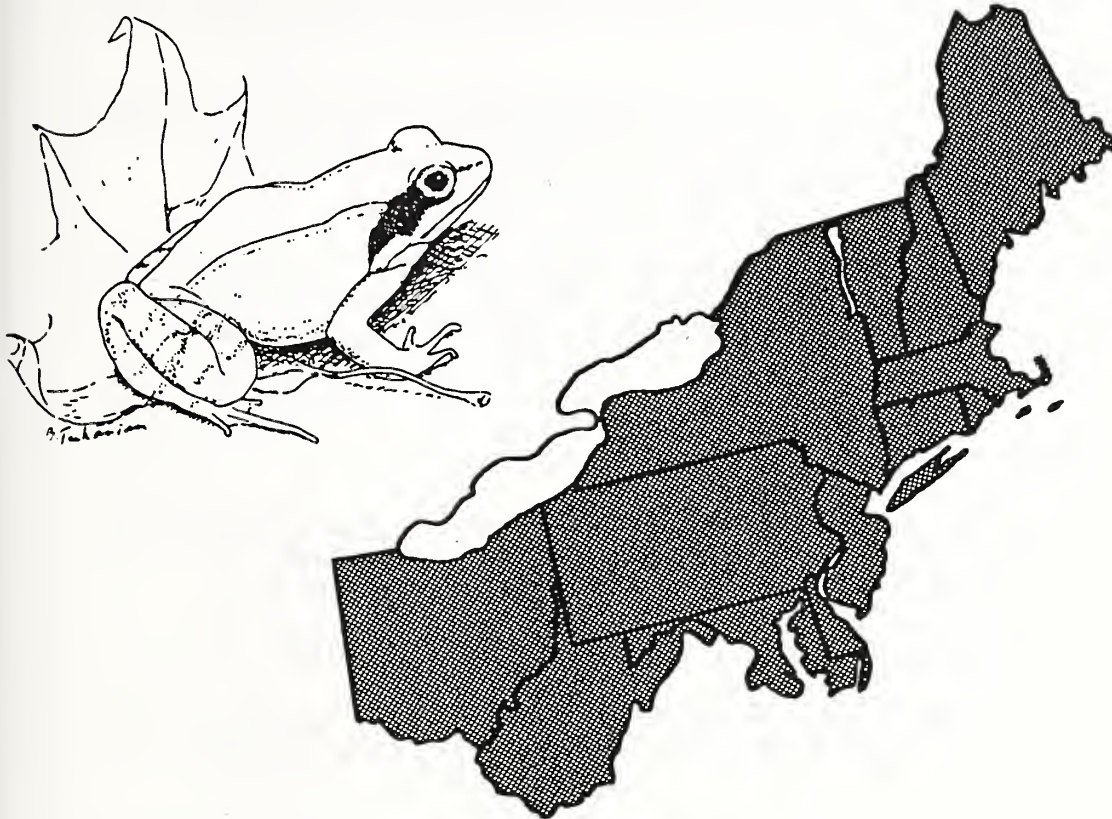
Selected References: Logier 1952, Marshall and Buell 1955, Hedeen 1977.

Wood Frog

Anura

Rana sylvatica

Ranidae



Range: Atlantic provinces and n. Quebec to Alaska (northern limit is along treeline) south into North Dakota, the Great Lakes States, to the Appalachians in Tennessee and extreme n. Georgia. Throughout the Northeast.

Relative Abundance in the Northeast: Common in suitable habitat.

Habitat in the Northeast: Terrestrial; in mesic woods, often far from water during the summer months as woodland ponds dry up; xeric woods with moist micro-habitats (M. Klemens, pers. commun.). Prefers wooded areas with small ponds for breeding (Heatwole 1961). Found in boreal conifer forests, swamps and upland hardwood forests to elevations of 1,158 m (Trapido and Clausen 1938). Found in bogs and trap rock slopes in Connecticut (M. Klemens, pers. commun.). Hibernates under moist forest floor debris or flooded meadows (M. Klemens, pers. commun.) from October to late March. Embryos and larvae showed limited tolerance to water with a high humic content in a Minnesota peat bog (Karns 1980).

Special Habitat Requirements: Prefers temporary woodland pools, back waters of slow moving streams.

Wood Frog

Age, Size at Sexual Maturity: Males at 2 years, females at 3 years (Bellis 1961).

Breeding Period and Egg Deposition: March to July at temperatures of about 50°F. (Smith 1956:113). Often breeds before ice is off the water (Martof 1970:86.2). Egg-laying usually completed within 4 to 6 days (Herreid and Kinney 1967).

No. Eggs/Mass: 2,000 to 3,000 eggs (Wright 1914:16), 1,019 average in Massachusetts (Possardt 1974). Eggs attached to submerged twigs or free at the bottom in globular masses.

Time to Hatching: 10 to 30 days (Oliver 1955:236) temperature dependent.

Tadpoles: 6 to 15 weeks (Minton 1972:132). May overwinter in n. Canada.

Home Range/Movement: Average home range size for 453 individuals in a Minnesota peat bog was 77.2 yd² (64.5 m²), range 3.5 to 440.5 yd² (2.9 to 368.3 m²). Distance between captures averaged 12.3 yd (16.2 m) and ranged from 0 to 78 yd (0 to 71.3 m) as reported by Bellis (1965).

Food Habits/Preferences: Insects; particularly beetles, flies and hymenopterans (Moore and Strickland 1955), also spiders, snails, slugs and annelids.

Comments: Breeds before all other ranids in the Northeast. Adults have been observed migrating across surface ice toward chorusing wood frogs (T. Andrews, pers. observ.). Brush piles, grassy hummocks and other terrestrial objects used as cover rather than utilizing aquatic escape (Marshall and Buell 1955).

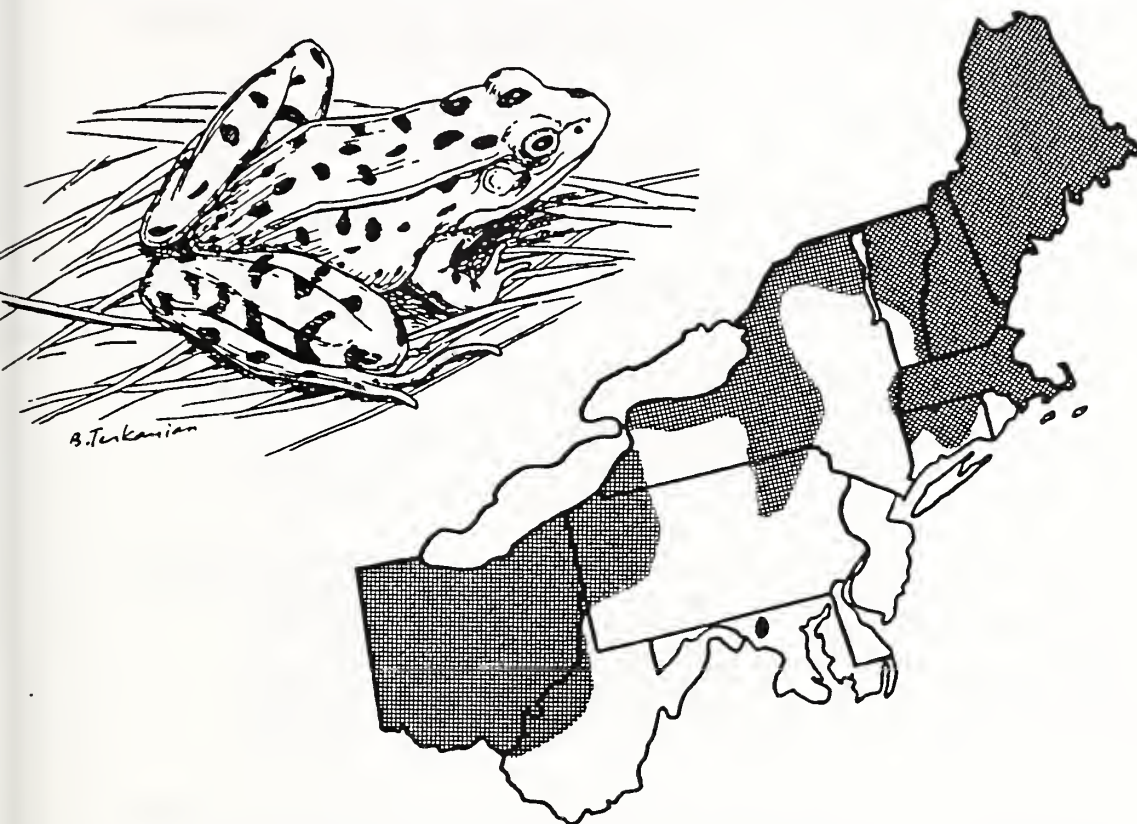
Selected References: Wright and Wright 1949, Heatwole 1961, Martof 1970.

Northern Leopard Frog

Anura

Rana pipiens

Ranidae



Range: Nova Scotia, s. Labrador to s.e. British Columbia, south to e. parts of Oregon, Washington and California, to n. Arizona and New Mexico, and east to Ohio, n. New York and New England.

Relative Abundance in the Northeast: Common; spotty distributions in southern part of range, very uncommon in some parts of formerly occupied range.

Habitat in the Northeast: Commonly in wet open meadows and fields and wet woods during summer months. River floodplains, Connecticut (M. Klemens, pers. commun.). Breeds in ponds, marshes, slow shallow streams, weedy lake inlets. Usually hibernates from October or November to March, hibernates under water in mud or in caves (Rand 1950). Sometimes emerges in early February (Smith 1956:110) and during warm days in winter (Zenisek 1964).

Special Habitat Requirements: Wet meadows.

Age/Size at Sexual Maturity: At 3 years of age in Michigan (Force 1933).

Northern Leopard Frog

Breeding Period and Egg Deposition: March to May, congregates to breed (Wright and Wright 1949:482).

No. Eggs/Mass: 4,000 to 6,500 eggs laid in masses in shallow water, sometimes attached to twigs.

Time to Hatching: 13 to 20 days (Wright 1914:58).

Tadpoles: 9 to 12 weeks, transform July and August. Overwinter as tadpoles in Nova Scotia (Bleakney 1952).

Home Range/Movement: Daily travel within home range reported to be usually less than 5 to 10 m in wet pasture and marsh (Dole 1965). Average nightly movement during rainy periods was 36 m in Michigan (Dole 1968). There was occasional long-range movement, often exceeding 100 m during rainy nights (Dole 1965).

Food Habits/Preferences: Insects; particularly beetles, lepidopteran larvae, wasps, bugs, crickets, grasshoppers and ants; also takes sowbugs, spiders, small crayfish, snails and myriopods. Almost 99% of food items were insects and spiders (Drake 1914). Occasional records of having taken small birds and snakes. Food species taken correlates with peaks in insect prey abundance (Linzey 1967).

Comments: During dry summer days frogs may sit in "forms," small clearings made in wet soil within their home range (Dole 1965). Most northeastern leopard frogs are probably introduced "exotics" released from laboratories and classrooms. Some believe the species is not native to New England (T. Tynning, pers. commun.).

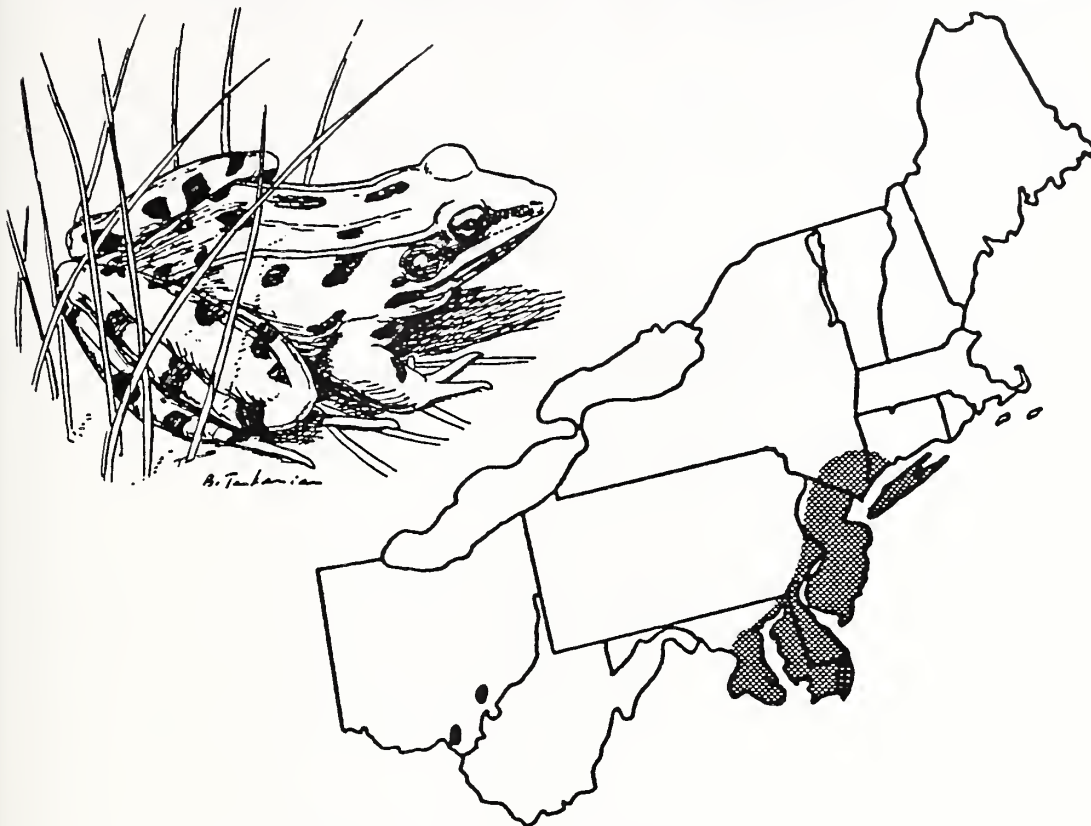
Selected References: Logier 1952, Dole 1968.

Southern Leopard Frog

Anura

Rana sphenocephala

Ranidae



Range: Long Island and extreme s.e. New York and New Jersey south through the Coastal Plain to Florida, west through the Gulf States to e. Texas with n. range limits in Missouri, c. Illinois and Indiana. Absent from the higher elevations of the Appalachians.

Relative Abundance in the Northeast: Unreported.

Habitat in the Northeast: Ponds, meadows, swamps, bogs, margins of streams and lakes, canals, flooded roads and ditches. Most frequently occurs in open situations. Remains near water during spring and fall but may be found inland during the summer.

Special Habitat Requirements: Aquatic situations for breeding.

Age/Size at Sexual Maturity: Unreported.

Breeding Period and Egg Deposition: March to December, peak in April and August.

Southern Leopard Frog

No. Eggs/Mass: 3,000 to 5,000 eggs, attached to submerged twigs and stems in quiet shallow, often temporary water.

Time to Hatching: 7 to 12 days in Indiana (Minton 1972:126).

Tadpoles: 67 to 86 days (Wright and Wright 1949:494). May remain as tadpoles through the winter.

Home Range/Movements: Unreported.

Food Habits/Preferences: Beetles and other insects, caterpillars, spiders, snails, small frogs and sometimes other small vertebrates (Minton 1972:126-127).

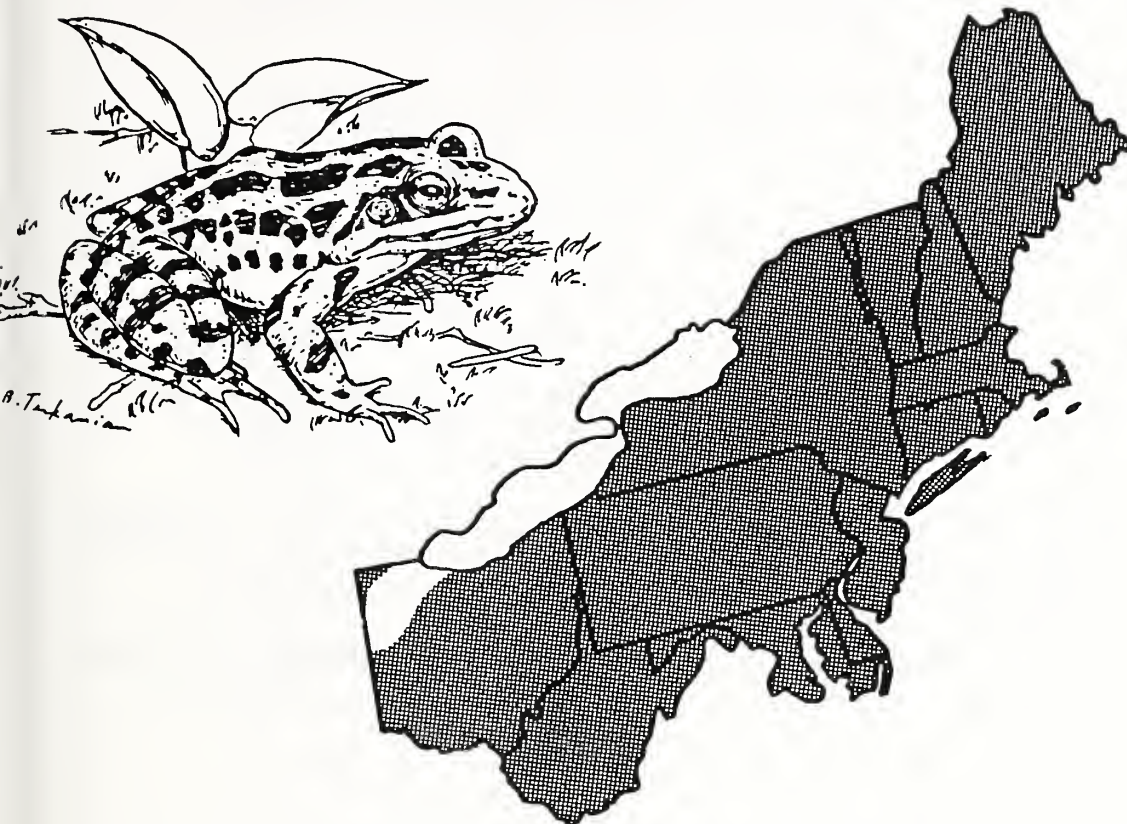
Selected References: Wright and Wright 1949, Minton 1972.

Pickereel Frog

Anura

Rana palustris

Ranidae



Range: Nova Scotia and the Gaspé Peninsula through s.e. Ontario to Wisconsin south to e. Texas and east to South Carolina. Absent from c. Illinois, n.w. Ohio and parts of the South.

Relative Abundance in the Northeast: Locally common.

Habitat in the Northeast: Colder waters of lakes, ponds, clear streams, springs, sphagnum bogs, limestone quarry pools. In Massachusetts, fairly ubiquitous along streams and shores of permanent ponds and lakes (T. Andrews, pers. commun.). In summer found in pastures, fields or woodlands, often at a distance from water. Prefers water with thick vegetation at edges for cover. Hibernates in mud at bottom of ponds or in ravines under stones from October to March. Some individuals found wintering in caves in Indiana (Rand 1950).

Special Habitat Requirements: Shallow, clear water of bogs and woodland ponds for breeding.

Age/Size at Sexual Maturity: Unreported.

Pickereel Frog

Breeding Period and Egg Deposition: March to May.

No. Eggs/Mass: 2,000 to 3,000 eggs (Wright 1914:67). Eggs laid in firm globular masses attached to submerged plants and branches.

Time to Hatching: 11 to 21 days (Wright 1914:67).

Tadpoles: 80 to 100 days, some overwinter as tadpoles. Transform July to September.

Home Range/Movement: Unreported.

Food Habits/Preferences: In adults, 95% of food items were terrestrial arthropods (Smith 1956:108). Snails, small crayfish, aquatic amphipods and isopods are also eaten.

Comments: Diurnal; may be crepuscular during hot weather. Sensitive to pollution and changes in water quality. Skin secretions may be toxic to other amphibians confined with pickereel frogs.

Selected References: Wright and Wright 1949, Smith 1956, Schaaf and Smith 1971.



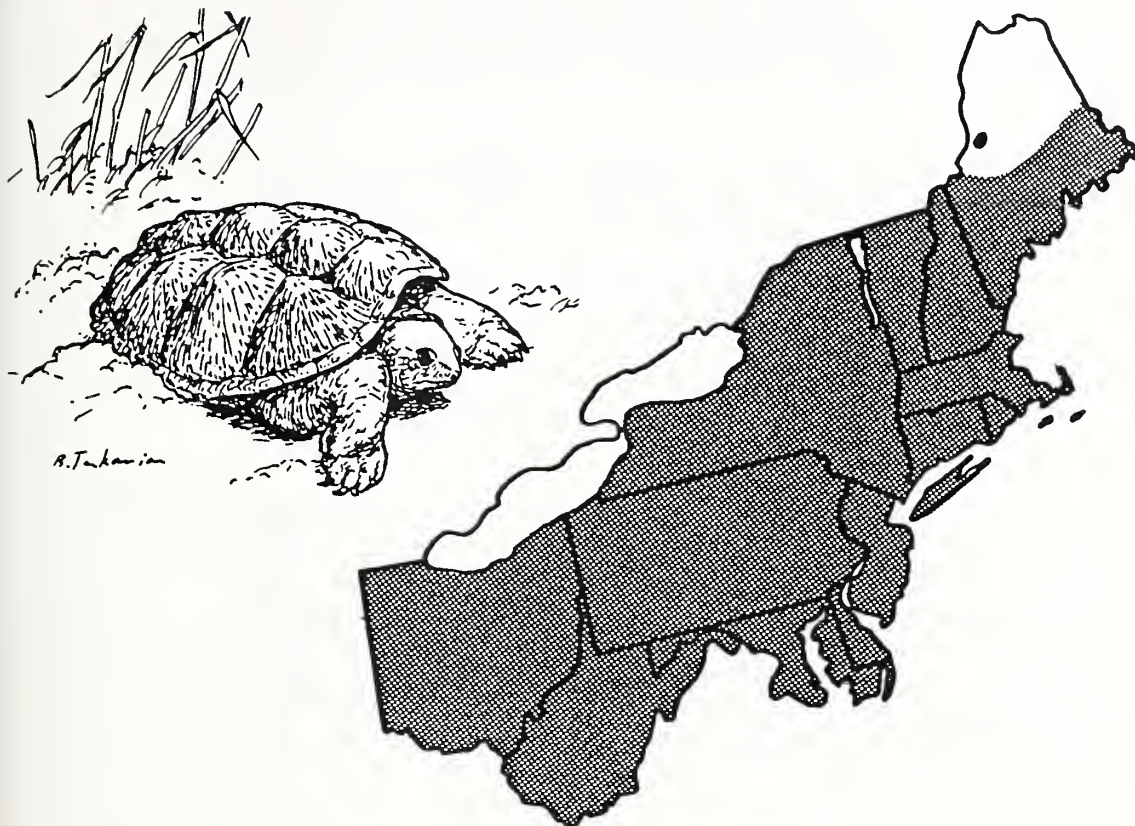
REPTILES

Common Snapping Turtle

Chelydra serpentina

Testudines

Chelydridae



Range: Across the e. U.S. to the Rocky Mountains, s. Canada to the Gulf of Mexico and into Central America.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Bottom dweller in any permanent and many semi-permanent bodies of fresh or brackish water; occasionally in temporary water. Marshes, swamps, bogs, pools, lakes, streams, rivers, frequently in areas with soft muddy banks or bottoms. Formerly thought to prefer permanent water. Almost entirely aquatic, but will travel overland. Hibernates from October to March or April in mud or debris at lake bottoms, banks, and muskrat holes, but has been seen walking on and under the ice (Carr 1952:64). Little known about winter activity.

Special Habitat Requirements: Aquatic habitat.

Age/Size at Sexual Maturity: Carapace length of 10 in (25.4 cm) as reported by Hammer (1969).

Breeding Period: Late April to November, sperm may remain viable in females for several years.

Common Snapping Turtle

Egg Deposition: Mid-June. Nests made in soil of banks or in muskrat houses. Also on lawns, driveways, fields, sometimes far from water.

Clutch Size: 11 to 83 eggs; females may lay two clutches per year in southern portions of range. Typically 20 to 30 eggs per clutch (Cahn 1937 cited in Conant 1938:128).

Incubation Period: 55 to 125 days (Hammer 1969), typically 80 to 91 days but dependent upon environmental conditions.

Eggs Hatch: Late August to early October, may overwinter in nest until spring in northern portions of range. Nests often destroyed by mammalian predators.

Home Range/Movement: Average distance traveled by 107 individuals was 0.69 mi (1.1 km), with most movement within the same marsh in South Dakota (Hammer 1969). In a New York marsh, movement of 100 m was the average for 85 individuals; home ranges 3 to 9 ha (Kivait 1980). Established range in Pennsylvania 4.5 ac (1.8 ha), reported by Ernst (1968b). Quite migratory. Females exhibit strong nesting site fidelity and will travel more than 0.5 km overland through forest and uneven terrain between water bodies in Ontario. Maximum distance of 16 km between home range and nesting site (Obbard and Brooks 1980).

Food Habits/Preferences: Omnivorous feeders; animal matter comprising 54% of prey items including fish (40%), crayfish, aquatic invertebrates, reptiles, birds, mammals; plant material 37% (Alexander 1943). Primary fish species in diet included suckers, bullheads, sunfish, and perch in Connecticut (Alexander 1943). May occasionally take young waterfowl; not destructive to natural systems concerning fish or waterfowl. Scavenges for any food readily available.

Comments: High levels of persisting organochlorine contaminants found in the tissues of Hudson River specimens (Stone et al. 1980).

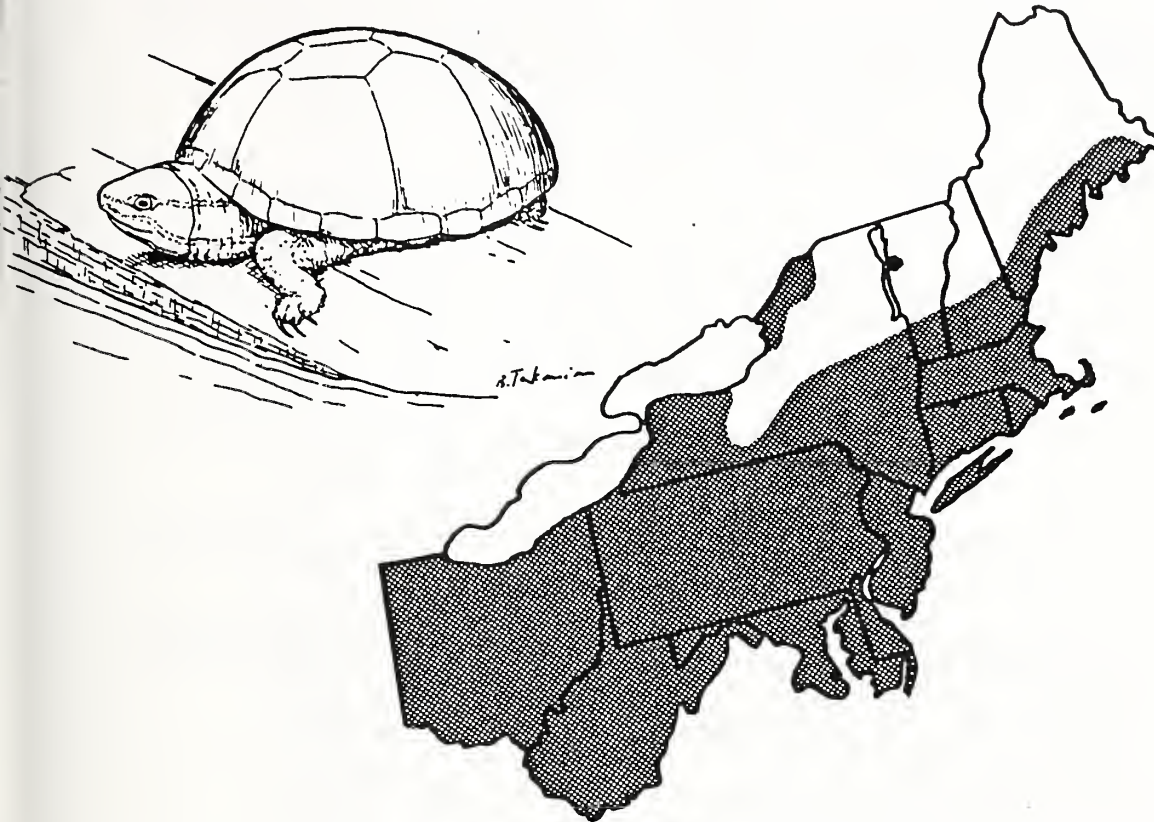
Selected References: Babcock 1919, Hammer 1969, Kivait 1980.

Stinkpot

Testudines

Sternotherus odoratus

Kinosternidae



Range: Atlantic coast, s. Ontario, west to the Mississippi River, south to c. Texas, s. Florida. Absent from n. New England.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Permanent bodies of water: still, shallow, clear lakes, ponds, and rivers, muddy bottoms preferred. Frequently found in reservoirs (M. Klemens, pers. commun.). Refrains from using temporary water sources. Formerly thought to refrain from using water with fluctuating levels. Not in streams at higher elevations in the East. Large populations found in areas with abundant aquatic growth (Pope 1939:39). Scattered records for occurrence in marshes, swamps, bogs, sloughs (Pope 1939:39). Usually gregarious when hibernating in bottom mud, debris, beneath rocks in river bottoms, or in river banks when the temperature falls below 10 C (Cagle 1942).

Special Habitat Requirements: Permanent water bodies. Exclusively aquatic except when laying eggs.

Stinkpot

Age/Size at Sexual Maturity: Stinkpots in the northern portion of the range mature more slowly than individuals in the southern regions. Males at 3 or 4 years, females at 2 to 7 years (Tinkle 1961), or perhaps at 9 to 11 years (Risely 1932).

Breeding Period: April to October, peak in April to May, September to October.

Egg Deposition: May to August, peak in June. Eggs laid in muck, rotted logs, stumps, sandy soil, grass, or on the ground on lake margins.

Clutch Size: 1 to 9 eggs (highest numbers in North), typically 3 to 6.

Incubation Period: 60 to 90 days (Barbour 1971:162), 35 to 40 days (Edgren 1960).

Eggs Hatch: September to October (in North). Gregarious nesting habits, often odorous.

Home Range/Movement: Overland movements probably seasonal or forced (Ernst and Barbour 1972:40). Average home ranges of 0.06 ac (0.02 ha) for males and 0.12 ac (0.05 ha) for females in Oklahoma. Overland movements ranged from 166 to 227 ft (35.4 to 69.2 m) for males, and 113 to 146 ft (34.4 to 44.5 m) for females (Mahmoud 1969). Exhibited homing behavior in Michigan--13 out of 28 released individuals traveled up to 700 ft (213 m) to initial capture points (Williams 1952).

Food Habits/Preferences: Principally carnivorous, feeds along the bottom for snails, clams, aquatic insects and their larvae, particularly dragonfly nymphs and caddisfly larvae (Lagler 1943), minnows, worms, tadpoles, and fish eggs (Babcock 1919:36). As scavengers, plants, algae, and carrion are also eaten. Carrion comprised 40% of the diet by volume for 73 individuals in Michigan (Lagler 1943).

Comments: Also called the musk turtle. Often basks well out of water on horizontal limbs of slanting trees along the waters' edge. Known to bask on overhanging branches and on logs and rocks. Highly aquatic; activity periods in morning and evening in Oklahoma (Mahmoud 1968). Nocturnal, best observed with a flashlight along lake/pond margins. Individuals frequently covered with algae growth.

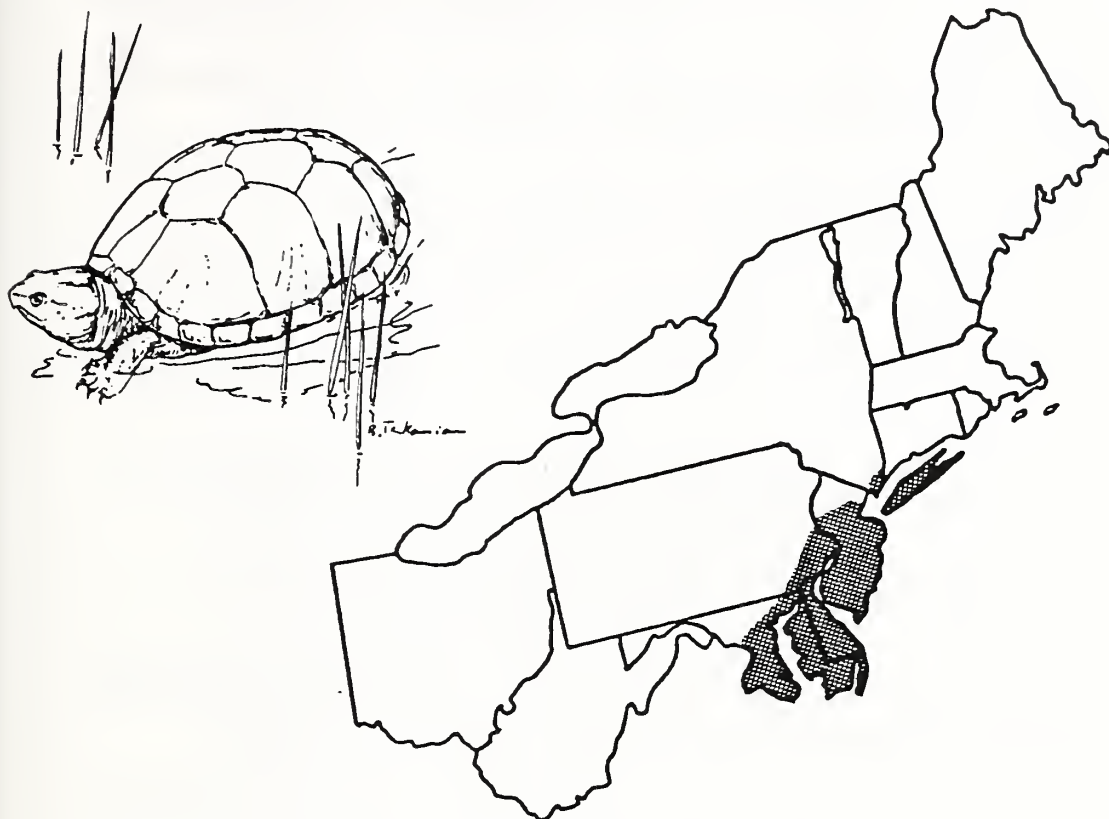
Selected References: Mahmoud 1969, Ernst and Barbour 1972.

Eastern Mud Turtle

Testudines

Kinosternon s. subrubrum

Kinosternidae



Range: Long Island and Staten Island along coast to Mississippi River across to n. Florida. Not found north of Harbor Hill recessional moraine, Wisconsin Glaciation (Craig et al. 1980).

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Permanent or temporary, fresh or brackish shallow water with aquatic vegetation. Found in shallow lakes with overhanging vegetation, marshes, small ponds, ditches, wet fields and offshore islands. Semi-aquatic, not found in deep or moving water. Will burrow into mud and aestivate when habitat dries. Hibernates in burrows in mud and dead leaves in marsh or field edges, below frost line, from October or November to March or April (Ernst and Barbour 1972:51). Some found active in winter.

Special Habitat Requirements: Still, shallow water with mud bottom.

Age/Size at Sexual Maturity: Females 5 to 8 years, males 4 to 7 years, Oklahoma (Mahmoud 1967). Plastron length of 75 to 80 mm for females in Arkansas (Iverson 1979).

Eastern Mud Turtle

Breeding Period: Mid-March to May.

Egg Deposition: June, later in the South. Eggs laid in depressions dug in soil, piles of vegetable debris, or in rotted wood.

Clutch Size: 2 to 6 eggs (Nichols 1947), typically 3 eggs per clutch. Three clutches laid per year (Iverson 1979).

Incubation Period: Average of 76 days (Lynn and vonBrand 1945), 106 days, Arkansas (Iverson 1979).

Eggs Hatch: September in Maryland (McCauley 1945:145), may overwinter in the nest.

Home Range/Movement: Limited home range, 0.12 to 0.13 ac (0.049 to 0.052 ha) (Mahmoud 1969) in Oklahoma.* In South Carolina, average travel was 3.6 m/day with a cycle of short movements of less than 2 m/day, followed by burrowing (up to 2 weeks), then longer moves (10 m/day) until December when movement stopped (Bennet et al. 1970).

Food Habits/Preferences: Forages in bottom mud. Omnivorous, eating insects, crustaceans, mollusks, amphibians, carrion and aquatic vegetation (Mahmoud 1968).

Selected References: Mahmoud 1969, Ernst and Barbour 1972, Iverson 1977.

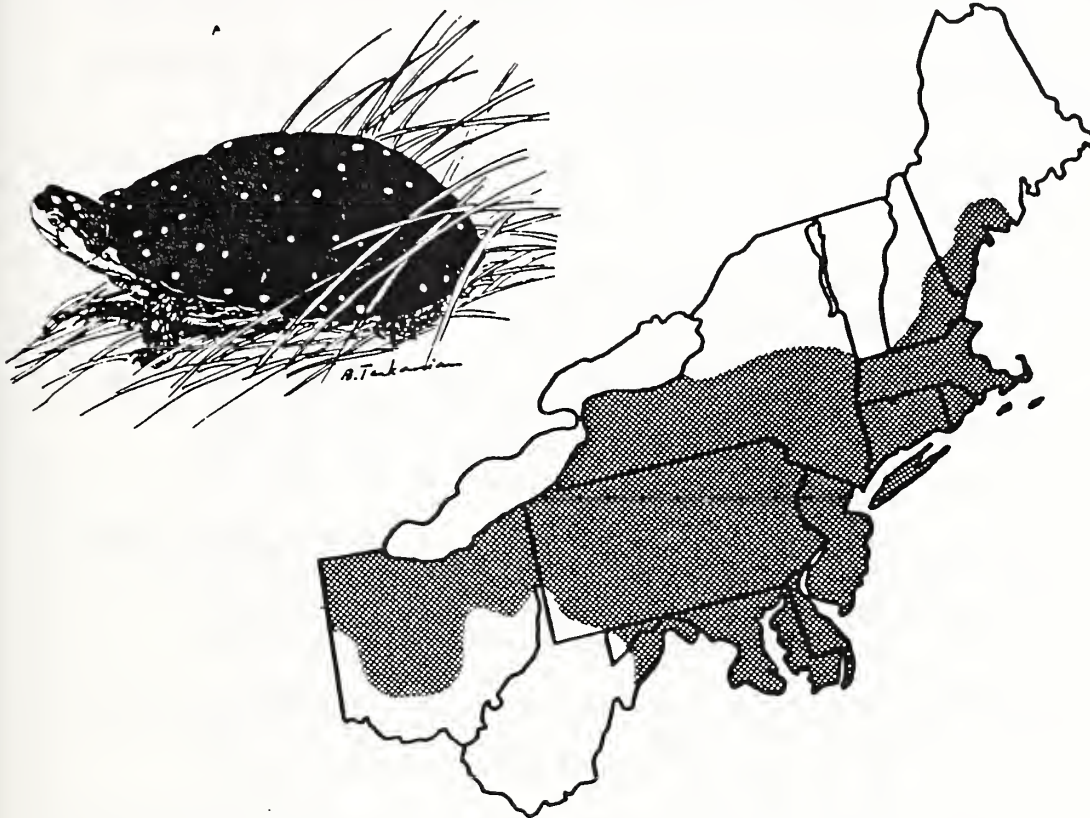
*Subspecies *K. s. hippocrepis*.

Spotted Turtle

Clemmys guttata

Testudines

Emydidae



Range: Southern Maine to s. Quebec west to Lake Michigan, n. half of Ohio to e. portion of Virginia south to n. Florida.

Relative Abundance in the Northeast: Uncommon to rare.

Habitat in the Northeast: In unpolluted, small shallow bodies of water such as woodland streams, wet meadows, bog holes, small ponds, marshes, swamps, roadside ditches, and brackish tidal creeks. Prefers areas with aquatic vegetation. Hides in mud and detritus at bottom. Wanders over land. Basks along waters' edge on brush piles in water (Graham, pers. commun.) and on logs or vegetation clumps. Often found in cranberry bogs. Hibernates in muddy bottoms during the coldest winter months. May aestivate during hottest periods of summer (T. Tyning, pers. commun.).

Special Habitat Requirements: Unpolluted shallow water.

Age/Size at Sexual Maturity: Males ≥ 83.4 mm plastron length, females ≥ 80.8 mm plastron length in Pennsylvania (Ernst and Barbour 1972:73).

Spotted Turtle

Breeding Period: March to May, peak usually June.

Egg Deposition: June to July. Eggs usually laid in well-drained soil of marshy pastures, or in tussocks (M. Klemens, pers. commun.).

Clutch Size: 1 to 8 eggs (Adler 1961), average 3 to 5.

Incubation Period: 70 to 83 days.

Eggs Hatch: Late August (Ernst and Barbour 1972:74) to September (Finneran 1948). Overwintering in nest may occur.

Home Range/Movement: Adults in a Pennsylvania marsh averaged 1.3 ac (0.5 ha) according to Ernst (1968b), moved less than 0.5 mi (0.8 km) also reported by Ernst (1968a). Females migrate outside of home range to nest (Ernst 1970).

Food Habits/Preferences: Omnivorous, eating crustaceans, mollusks, spiders, earthworms, aquatic insects, and other invertebrates; occasionally takes frogs and tadpoles, small fish, carrion, and vegetable matter. Food taken only under water.

Comments: Over-collecting, coupled with draining and filling of swamps (and possibly pollution) is depleting the population. A strongly diurnal species (Graham and Hutchinson 1979).

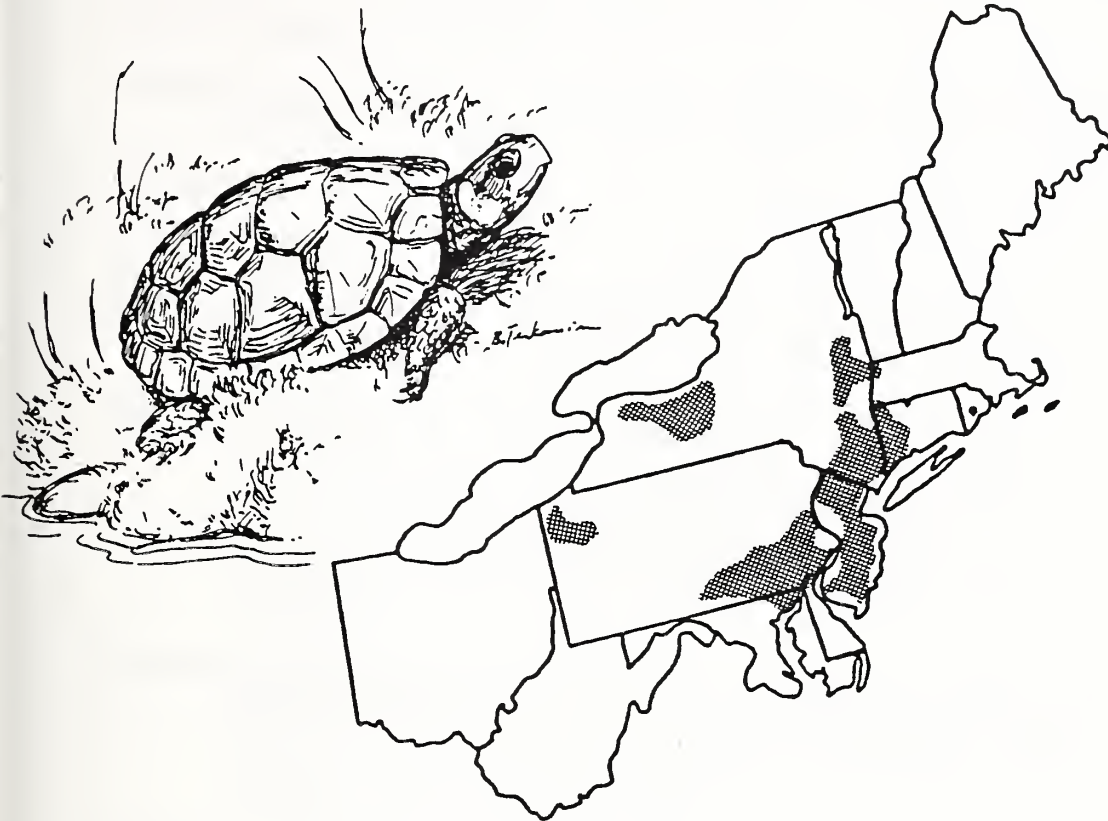
Selected References: Ernst 1972a, Ernst and Barbour 1972, Stewart 1974.

Bog Turtle

Testudines

Clemmys muhlenbergi

Emydidae



Range: Scattered colonies through New York, south to n.e. Maryland, s. Virginia, w. North Carolina and Georgia.

Relative Abundance in the Northeast: Endangered (Federal List).

Habitat in the Northeast: Unpolluted open sphagnum bogs or wet meadows; sluggish clear meadow streams with muddy or mucky bottoms (Zappalorti et al. 1979). Frequents shallow meandering waterways. In Connecticut associated with open canopy and calcareous wetlands (M. Klemens, pers. commun.). Hibernates mid-autumn to late March or April. Hibernaculum is in a subterranean rivulet or seepage area with continually flowing water in New Jersey (Zappalorti and Farrell 1980). Commonly basks in spring and early summer. In New Jersey bogs, individuals found basking on sedge grass tussocks or in open shallow pools (Zappalorti et al. 1979).

Special Habitat Requirements: Abundance of grassy or mossy cover, high humidity and full sunlight.

Age/Size at Sexual Maturity: At 5 years at plastron length of 75 mm (Barton and Price 1955). From 6 to 8 years, at plastral length of 70 mm (Ernst 1977).

Bog Turtle

Breeding Period: Late April to early June.

Egg Deposition: June to July, often in tussocks or on top of sphagnum in open, sunny areas of bogs (Zappalorti et al. 1979).

Clutch Size: 2 to 5, typically 2 to 3 (Zappalorti et al. 1979).

Incubation Period: 7 to 8 weeks (Nemuras 1969).

Eggs Hatch: July to early September (Ernst and Barbour 1972:77-78).
In northern locations hatchlings may overwinter in the nest.

Home Range/Movement: Average range was 1.28 ha for 19 individuals in Lancaster County, Pennsylvania (Ernst 1977). Ranging from 0.008 to 0.943 ha, with travel through wet runs (Barton 1957 cited in Ernst 1977:246). Average movement was 12 m between recaptures for a male; when displaced the same individual moved 0.4 km in 1 day returning to initial point of capture (Ernst and Barbour 1972:79).

Food Habits/Preferences: Omnivorous, eating berries (20%), insects (80%), (Surface 1908:158), also slugs, earthworms, crayfish, frogs, snakes, nestling birds, seeds of pondweeds and sedges, snails, carrion; availability determines food consumption (Barton and Price 1955). Forages on land and under water.

Comments: Formerly named Muhlenberg's turtle. May aestivate during dry summer months (Ernst and Barbour 1972:77). Seldom active during the hottest part of the day (Zappalorti and Farrell 1980). Overcollection of this species is a problem, and locality information should be reported with discretion to prevent exploitation. Formerly abundant; population decrease related to wetland drainage and fill.

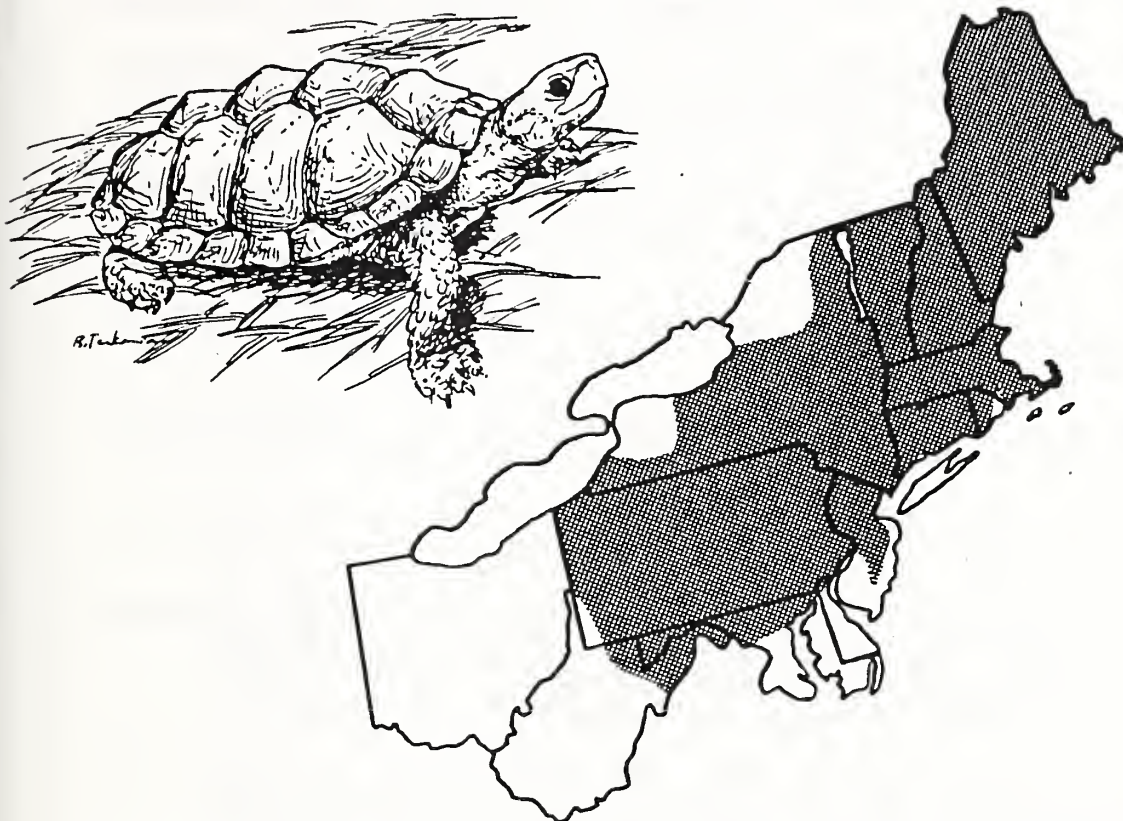
Selected References: Barton and Price 1955, Ernst and Bury 1977, Bury 1979, Zappalorti et al. 1979, Zappalorti and Farrell 1980.

Wood Turtle

Clemmys insculpta

Testudines

Emyridae



Range: Nova Scotia west through the Great Lakes region to e. Minnesota.
In the East extending southward to n. Virginia.

Relative Abundance in the Northeast: Once common, population declining.

Habitat in the Northeast: Frequents slow moving meandering streams with sandy bottoms and overhanging alders (Graham, pers. commun.). Basks during morning hours along banks of streams. Disperses from water sources during summer months to fields, woods, roadsides. Restricted to hardwood forest areas in New Jersey (Farrell and Zappalorti 1979).

Returns in fall to streams to hibernate in muddy banks and bottoms through late March to April. Have been found hibernating in holes in stream banks (Graham, pers. commun.), in decaying vegetation of woods and trout streams with deep pools (M. Klemens, pers. commun.). Will also use abandoned muskrat burrows (Collins 1976 cited in Farrell and Zappalorti 1979:11). Some use same hibernaculum each year (Farrell and Zappalorti 1979).

Special Habitat Requirements: Wooded river banks.

Wood Turtle

Age/Size at Sexual Maturity: Unreported.

Breeding Period: March, May, October (Ernst and Barbour 1972:82), when stream temperature reaches about 15 C (Farrell and Zappalorti 1979). Mating occurs in water.

Egg Deposition: May to June. Eggs laid in prepared depressions in open areas with sandy soils or gravel, not necessarily near water.

Clutch Size: 4 to 12 eggs (Carr 1952:122), average 8 to 9 (Farrell and Zappalorti 1979).

Incubation Period: 77 days (Allen 1955), 58 to 69 days in laboratory (Farrell and Zappalorti 1980).

Eggs Hatch: August to October. Hatchlings may overwinter in the nest in northern parts of range.

Home Range/Movement: One male moved an average of 90 m for 3 recaptures, one female was found 15 m from initial capture point (Ernst and Barbour 1972:83). Exhibited fidelity to a particular stream or brook in New Jersey (Farrell and Zappalorti 1979).

Food Habits/Preferences: Omnivorous, eating young vegetation, grass, moss, mushrooms, berries, insects and their larvae, worms, slugs, snails (Surface 1908:161-162); also carrion, tadpoles, frogs, and fish. Feeds in water or on land.

Comments: Formerly thought to be one of the most terrestrial turtles, now found equally in water or on land. Lives in large groups or colonies (Farrell and Zappalorti 1979). Diurnal. Development of wooded river banks and widespread commercial collection are factors contributing to population decline. Not tolerant of pollution. Young not often encountered.

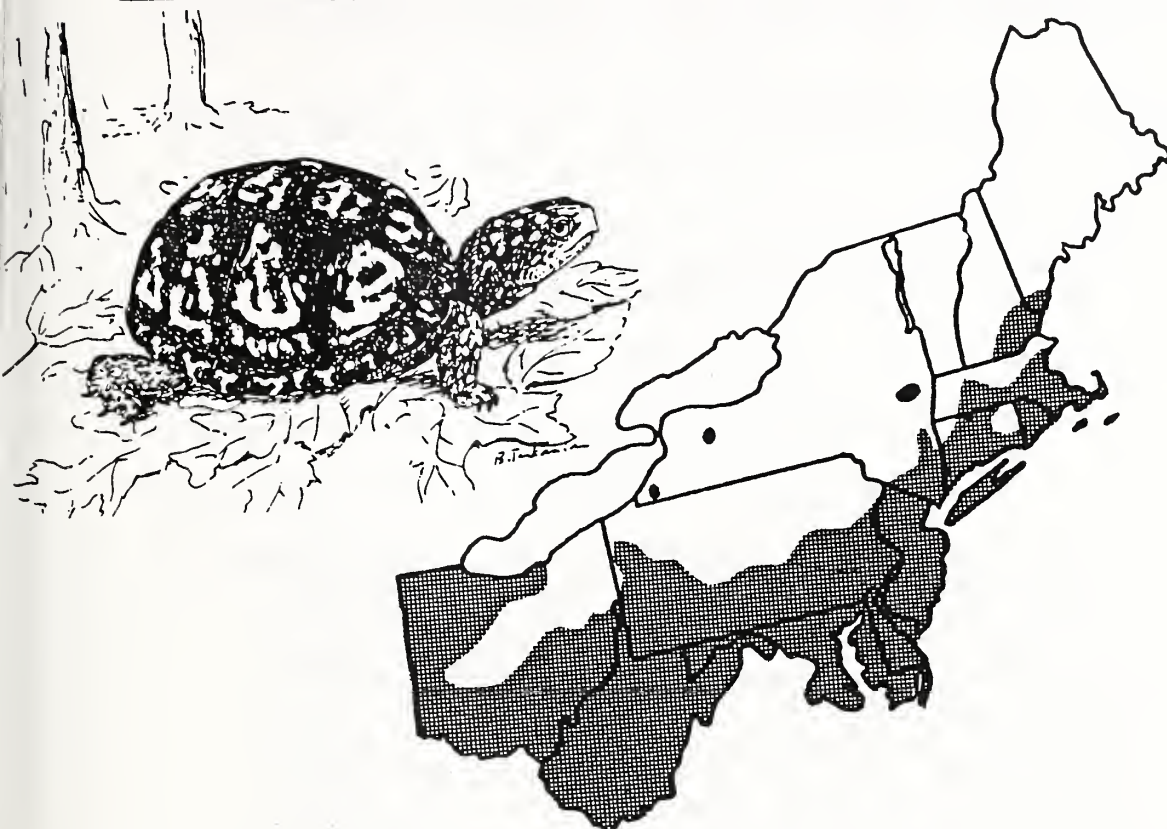
Selected References: Ernst 1972b, Farrell and Zappalorti 1979.

Eastern Box Turtle

Terrapene c. carolina

Testudines

Emyridae



Range: Southeastern Maine and the Thousand Island region of New York west to the Mississippi River, c. Illinois and south to n. Florida.

Relative Abundance in the Northeast: Locally common, more abundant farther south; declining in many areas.

Habitat in the Northeast: Woodlands, field edges, thickets, bogs, stream banks; typically found in well-drained forest bottomland (Stickel 1950). Young semi-aquatic. Has been observed swimming in slow moving streams. Found chiefly in open deciduous forests (N. Green, pers. observ.). Also found on mountain slopes in Massachusetts (T. Tying, pers. commun.). During hot dry weather may soak in mud or water or burrow under logs or decaying vegetation for extended periods. When not active, nests in brush piles and thickets. Hibernates from depths of several inches to 2 ft (0.6 m) below surface in loose soil, decaying vegetation, mud, or in stream banks from late fall to April.

Special Habitat Requirements: Old fields, powerline clearings, ecotones with sandy soils favored (M. Klemens, pers. commun.).

Eastern Box Turtle

Age/Size at Sexual Maturity: 4 to 5 years (Ernst and Barbour 1972:43),
5 to 10 years (Minton 1972:165).

Breeding Period: After emerging from hibernation in April, sometimes
continuing to fall. Females may lay viable eggs for up to 4
years after mating (Ewing 1943).

Egg Deposition: June to July in the Northeast. Females often seen
crossing roads in Massachusetts and New Jersey during nesting
season (Graham, pers. commun.).

Clutch Size: 3 to 8 eggs, average 4 to 5.

Incubation Period: 87 to 89 days (Allard 1935 cited in Carr 1952:146).

Eggs Hatch: August to September, may overwinter in nest.

Home Range/Movement: From 150 to 750 ft (45.7 to 228.4 m); 12 individuals
averaged movement of 390 ft (118.8 m) on Long Island (Breder 1927).
For 62 individuals in mixed woodlands and open habitat on Long
Island average range was less than 750 ft (228.4 m) as reported
by Nichols (1939). Stickel (1950) reported average diameter was
350 ft (106.6 m) in Maryland. One individual was found within
0.25 mi (0.4 km) from point of release 60 years previously
(Allen 1968 cited in Babcock 1919:412). Maintains same home
range for many years, occasionally leaves normal home range for
random wandering or egg laying (Stickel 1950). Homing instinct
displayed by 45 out of 60 turtles (Nichols 1939).

Food Habits/Preferences: Younger individuals chiefly carnivorous, older
individuals more herbivorous. Food items include animals such as
earthworms, slugs, snails, insects and their larvae, particularly
grasshoppers, moths, and beetles; crayfish, frogs, toads, snakes,
and carrion; vegetable matter such as leaves, grass, bugs, berries,
fruits, and fungi.

Comments: Terrestrial and diurnal. Digs into leaf litter towards end
of day. Bisection of habitat by roads can reduce or destroy
populations. The reversion of much agricultural land to woodland
may be a beneficial change to populations (Klemens, pers. commun.).
Estimated age at full growth is 20 years. May live 60 to 80 years
(Nichols 1939). Some individuals may live over 100 years (Graham
and Hutchinson 1969).

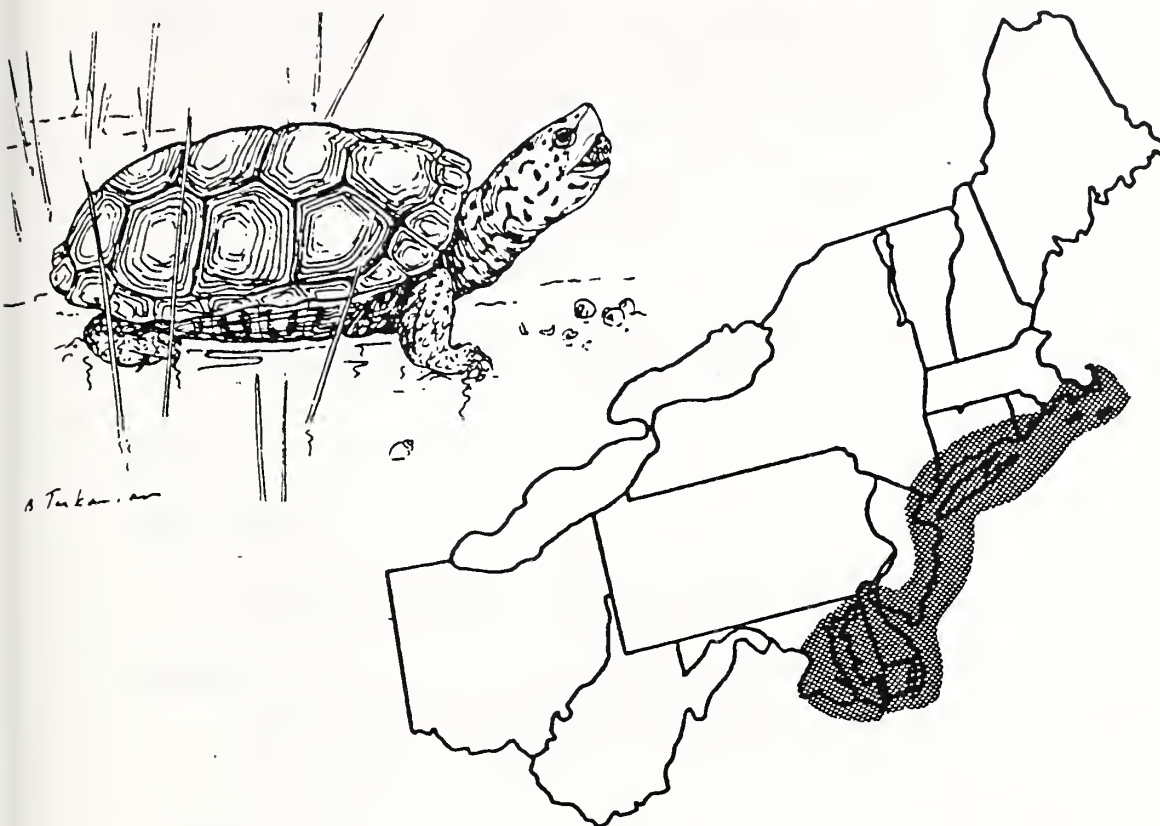
Selected References: Stickel 1950, Carr 1952, Ernst and Barbour 1972.

Northern Diamondback Terrapin

Testudines

Malaclemys t. terrapin

Emydidae



Range: Brackish waters of the Atlantic coast from Cape Cod to Cape Hatteras.

Relative Abundance in the Northeast: Uncommon to rare in Massachusetts and Rhode Island, extremely abundant in New Jersey and Maryland.

Habitat in the Northeast: Prefers salt marshes, brackish waters of coastal rivers, estuarine areas, tidal creeks. Nests built in sandy hummocks or dunes above high tide mark where the soil is anchored by grasses. Nests extensively on dike roads throughout the South Jersey coastal region (Graham, pers. observ.). Hibernates in muddy bottoms of streams or ponds. May emerge during warm spells. Basks on mud flats or island hummocks.

Special Habitat Requirements: Coastal rivers, salt marshes.

Age/Size at Sexual Maturity: Perhaps 7 years (Carr 1952:173).

Northern Diamondback Terrapin

Breeding Period: Soon after hibernating ends (Hay 1904). Early to mid-May in Jamaica Bay, Queens County, New York (R. Cooks, pers. commun.). Females may retain live spermatozoa for up to 4 years without subsequent matings (Oliver 1955:213).

Egg Deposition: May to June (Ernst and Barbour 1972:106).

Clutch Size: 5 to 12 eggs, average 8. 1 to 5 clutches laid per individual.

Incubation Period: 42 to 90 days, temperature-dependent (Carr 1952:172). May overwinter in the nest.

Eggs Hatch: September.

Home Range Size: Unreported.

Food Habits/Preferences: Fish, crustaceans, soft mollusks, insects, succulent growth of marsh plants. Scavenger, forages while floating.

Comments: The terrapin was such a valuable food source that early in the 20th Century the U.S. Bureau of Fisheries established an artificial propagation program in North Carolina. This species has greatly recovered since the 1920s (M. Klemens, pers. commun.).

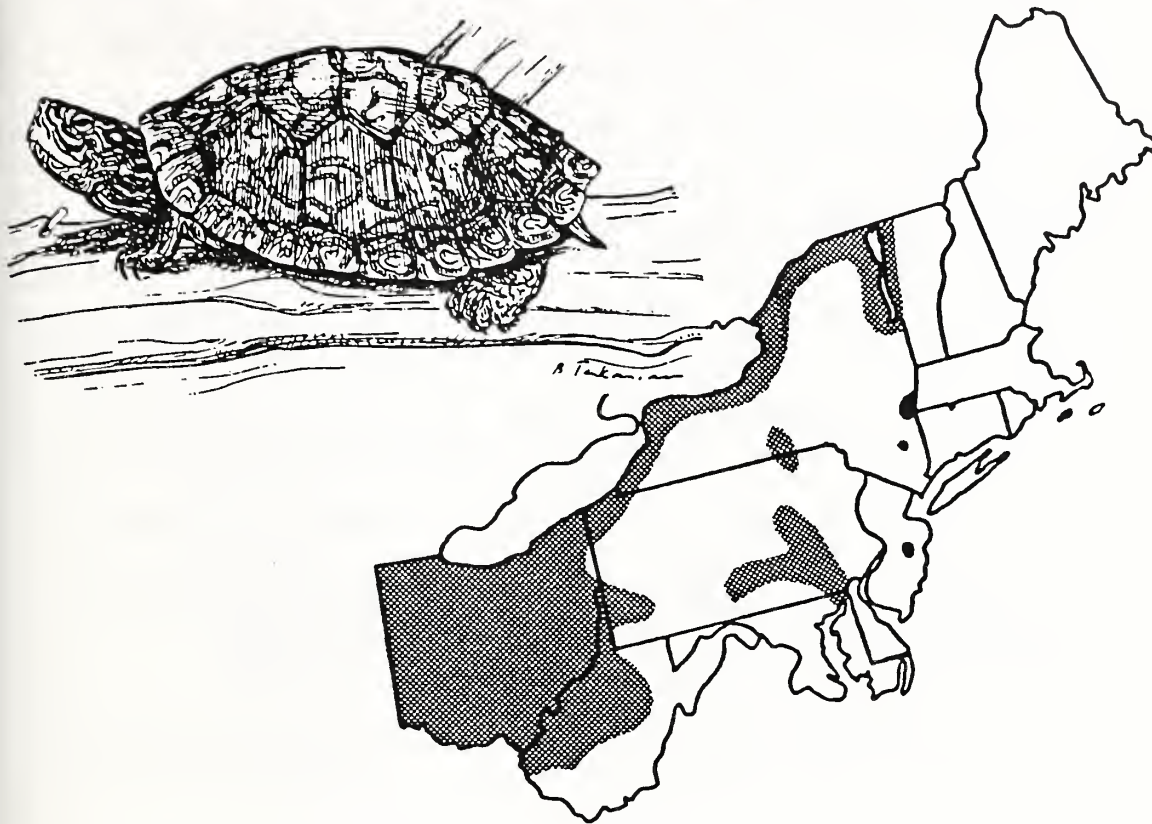
Selected References: Babcock 1919, Carr 1952, Ernst and Barbour 1972.

Map Turtle

Testudines

Graptemys geographica

Emydidae



Range: Lake George, New York to the Great Lakes west to the Mississippi drainage to e. Minnesota, south to Louisiana and n.w. Georgia. Along Susquehanna drainage. Introduced to Delaware River. Nests as far south as Poughkeepsie, Dutchess County, New York.

Relative Abundance in the Northeast: Uncommon and of limited distribution.

Habitat in the Northeast: Aquatic, inhabiting rivers and lakes. Prefers large bodies of water with soft bottoms and aquatic vegetation. Hibernates in mud of shallow water from late fall to early spring. May be active on or under ice. Gregoriously basks on logs or rocks or along beaches and grassy shores. In Michigan found in riffles of pebble bottom streams that have interspersed, deeper, muddier pools (M. Klemens, pers. commun.). Move from shallow bays to nesting areas and reenter bays to overwinter in Quebec (Gordon 1980).

Special Habitat Requirements: Water bodies with muddy or soft bottom substrate.

Map Turtle

Age/Size at Sexual Maturity: Females at 7.5 in (190.5 mm) and larger (Newman 1906 cited in Pope 1939:169).

Breeding Period: April and autumn (Ernst and Barbour 1972:110).

Egg Deposition: May to July, peak mid-June. Nesting season begins in mid-June in Quebec and averages 2 weeks in duration (Gordon 1980). Nests made in soft sand or soil away from beaches.

Clutch Size: 10 to 16 eggs (Cahn 1937), typically 12 to 14 eggs. More than one clutch may be laid.

Eggs Hatch: Late August to early September (Carr 1952:199), some may overwinter in the nest.

Home Range/Movement: Unreported.

Food Habits/Preferences: Aquatic feeders--snails and clams are the major components of the diet; other small mollusks, crayfish, vegetable matter, fish, insects, and carrion are eaten (Carr 1952:199).

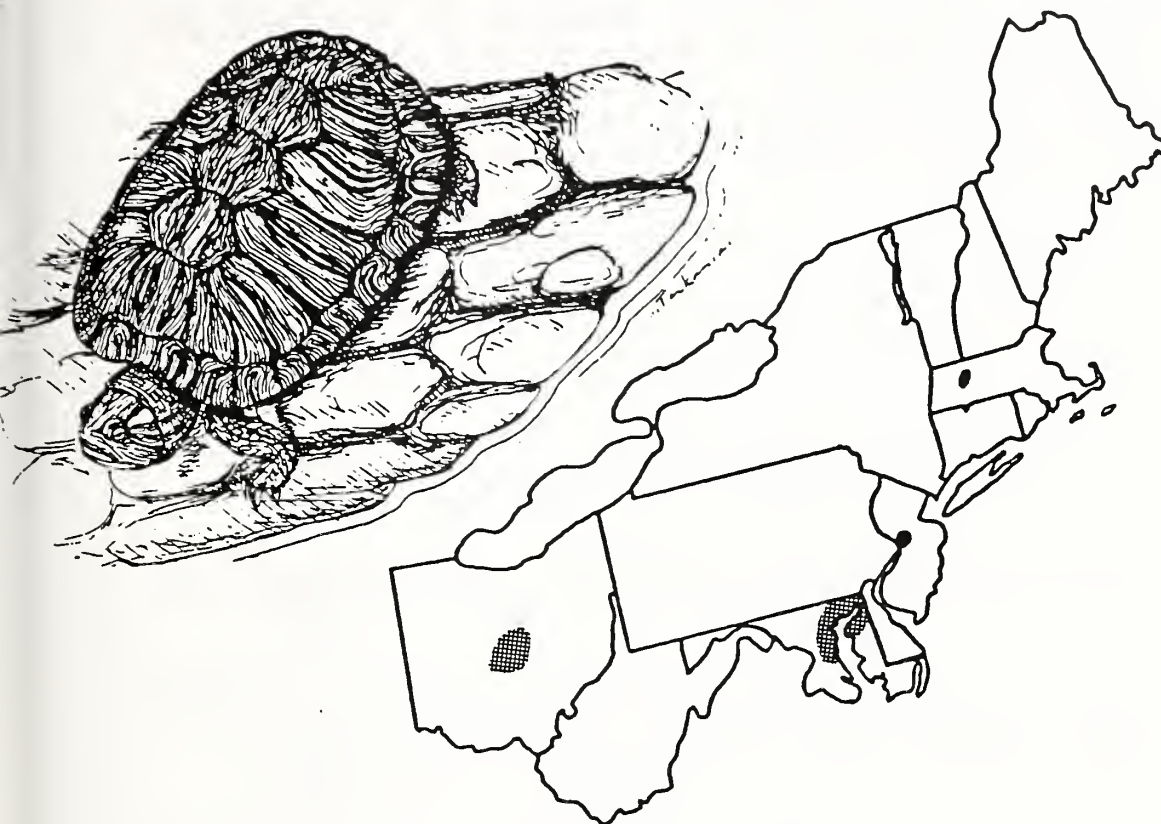
Selected References: Newman 1906, Evermann and Clarke 1916.

Red-eared Slider

Chrysemys scripta elegans

Testudines

Emydidae



Range: Central Ohio west to s.e. Iowa, south into New Mexico, Texas, Alabama and w. Tennessee. Feral in parts of the Northeast.

Relative Abundance in the Northeast: Locally common.

Habitat in the Northeast: Ponds, shallow areas of lakes, creeks, and drainage ditches. Hibernates when water drops below 10 C. Sometimes occupies muskrat burrows or hollow stumps.

Special Habitat Requirements: Quiet water with muddy bottom, abundant vegetation, projecting substrate, such as logs or rocks for basking.

Age/Size at Sexual Maturity: Determined by size rather than age: plastron length for males 90 to 100 mm, for females 150 to 195 mm.

Breeding Period: Unreported.

Red-eared Slider

Egg Deposition: April to mid-July. Females may be capable of reproducing for 40 to 50 years. Average longevity may be 50 to 75 years (Cagle 1950). Female excavates nest hole in earth, deposits eggs and seals hole with mud and debris. May move a mile (1.6 km) from water to find suitable nest site.

Clutch Size: 2 to 22, typically 5 to 10. 1 to 3 clutches per season.

Incubation Period: 68 to 70 days (incubated in laboratory, Cagle 1950*).

Eggs Hatch: July 1 to mid-September (Illinois and Louisiana).

Home Range/Movement: Most sliders (n=1,006) inhabiting a drainage ditch in Mississippi River floodplain remained within one-half mile (0.8 km) of release site (Cagle 1944:24).

Food Habits/Preferences: Omnivorous, taking tadpoles, crayfish, mollusks, large larvae of aquatic insects, small fish (Cahn 1937).

Comments: Possibly feral in Maryland (Cooper 1959). Active from late April until October in Illinois. Highly aquatic, avoids land except when laying eggs. Aestivates in mud when temperatures exceed 31 C (Cagle 1950:48).

Selected References: Cahn 1937, Cagle 1950, Cooper 1959, Webb 1961.

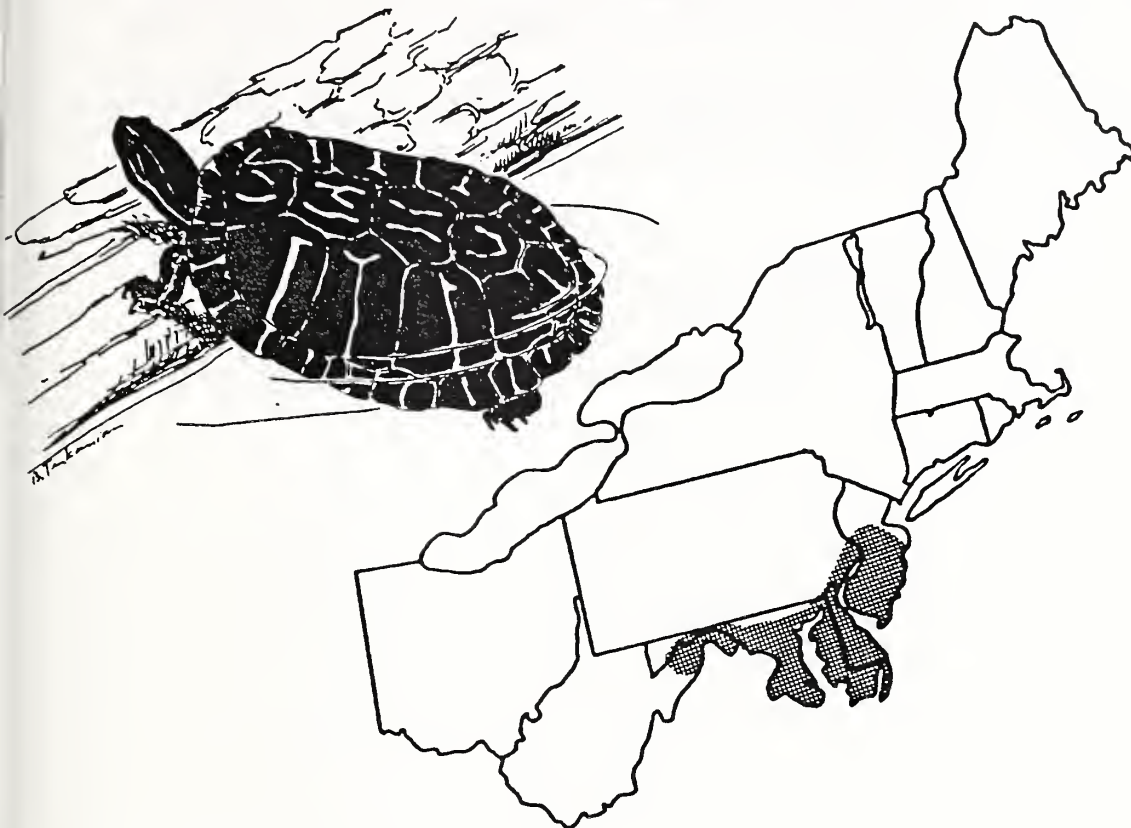
**Pseudemys scripta troastii*

Redbelly Turtle

Testudines

Chrysemys r. rubiventris

Emydidae



Range: Southern New Jersey throughout Maryland and inland to e. West Virginia, along the coast to Cape Hatteras.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Variable, including ponds, streams, lakes, salt marshes, rocky or muddy bottoms. Basks on shores or on rocks or logs. Hibernates in mud of ponds during winter months.

Special Habitat Requirements: Prefers larger bodies of fresh water.

Age at Sexual Maturity: Unreported.

Breeding Period: Presumed to be spring and fall.

Egg Deposition: June to early July. Eggs laid in fields bordering ponds or streams, along pond shores, near cranberry bogs in New Jersey (Graham 1980).

Redbelly Turtle

Clutch Size: 10 to 35 eggs (Martof et al. 1980:153).

Eggs Hatch: Early September in captivity (Carr 1952:272). May overwinter in the nest. Emerge in late summer or the next spring in the southern portion of range (Martof et al. 1980:153).

Home Range/Movement: Unreported.

Food Habits/Preferences: Omnivorous: aquatic vegetation, snails, tadpoles, crayfish, and fish are food items.

Selected References: Ernst and Barbour 1972.

Plymouth Redbelly Turtle

Testudines

Chrysemys rubiventris bangsi

Emydidae



Range: Plymouth County, Massachusetts.

Relative Abundance in the Northeast: Endangered (Federal List).

Habitat in the Northeast: Ponds of different sizes in Plymouth County.
Frequents shallow coves (Graham 1971a).

Special Habitat Requirements: Muddy-bottomed shallows with abundant aquatic vegetation, especially milfoil (*Myriophyllum*) and bladderwort (*Utricularia*) (Graham 1980).

Age/Size at Sexual Maturity: Probably not reached during first 9 years (Graham 1971a). Average life span estimated at 40 to 55 years (Graham 1980).

Breeding Period: Probably early spring and fall (Graham, pers. commun.).

Egg Deposition: Mid-June to early July.

Plymouth Redbelly Turtle

Clutch Size: Range 12 to 17 eggs (Graham, unpubl. ms.).

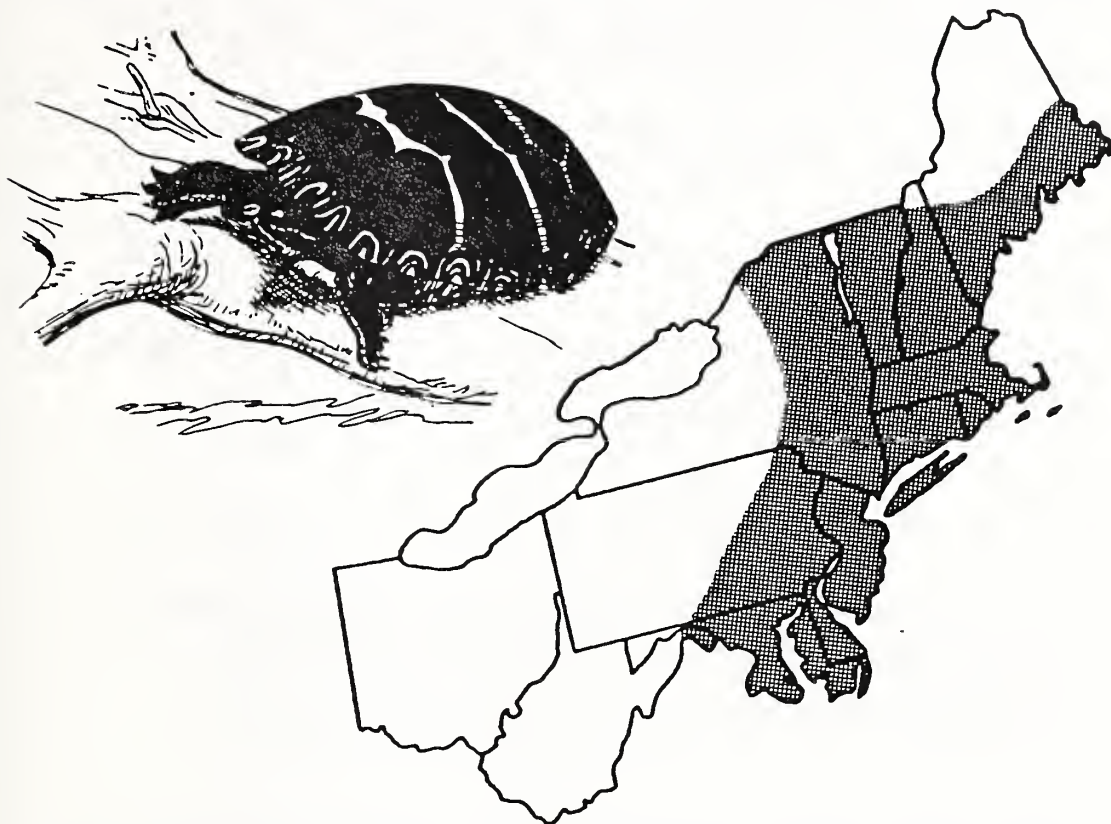
Eggs Hatch: Probably September, fall (Graham, pers. commun.), July if they overwinter. Average hatching time of 75 days for 17 eggs laid in a laboratory (Graham 1971a).

Home Range/Movement: Unknown but wanders on land especially during fall and late spring. Found 0.5 to 2.0 mi (0.8 to 3.2 km) from water on occasion. Significance of wandering unknown (Graham, unpubl. ms.).

Food Habits/Preferences: Primarily herbivorous, feeding mainly on milfoil, also feeds on bladderwort (Graham 1980) and arrowhead (*Sagittaria*) (Graham 1971a). Dietary shift to crayfish in fourth season (Graham 1971a).

Comments: Basks during early morning hours on elevated sites or in water by floating or resting on weed mats (Graham 1980). Discovered in Plymouth, Massachusetts by F. A. Lucas in 1869, first account in Copeia No. 38, 1916. Population estimate of about 100 in Plymouth County (Lazell 1976:155).

Selected References: Graham 1971a, 1971b, 1980; Lazell 1976.



Range: Nova Scotia to n.e. New York, south to Cape Hatteras and inland to e. Alabama. In the Northeast merges with range of the Midland painted turtle.

Relative Abundance in the Northeast: Common, often abundant.

Habitat in the Northeast: Quiet, shallow ponds, marshes, woodland pools, rivers, lake shores, wet meadows, bogs, slow moving streams. Sometimes in brackish tidal waters, salt marshes (Pope 1939:183). Stagnant and polluted waters are sometimes inhabited (Smith 1956: 150). When in water usually remains in submerged vegetation. Basks on small hummocks, logs, rocks, sometimes congregating in large groups. Hibernates by burrowing into mud or decayed vegetation of pond bottoms.

Special Habitat Requirements: Aquatic habitat.

Age/Size at Sexual Maturity: Correlated with size, in Michigan study males exceeded 81 mm plastron length, females ranged from 110 to 120 mm (Gibbons 1968a).

Eastern Painted Turtle

Breeding Period: March to mid-June and fall (Gibbons 1968a). Peak in April in Connecticut (Carr 1952:218).

Egg Deposition: May to July. Nest sites within a few yards of water (Cahn 1937 cited in Smith 1961:140), or up to one-half mile away (T. Tynning, pers. commun.).

Clutch Size: 2 to 11, females may lay 2 clutches, (Gibbons 1968a), typically 5 to 6.

Incubation Period: 72 to 80 days (Ernst and Barbour 1972:143). 63 days (Lynn and vonBrand 1945). Hatchings from late clutches may overwinter in the nest. Nests are often destroyed by raccoons and skunks.

Eggs Hatch: Late August to early September, in Connecticut (Finneran 1948).

Home Range/Movement: Displays short-distance homing ability; fewer than 15% moved more than 100 m in a marsh in Michigan (Gibbons 1968a). Average distance traveled was 112 m in a shallow bay of a Wisconsin lake; 70% of the turtles did not travel. Individuals may remain in the same locality for years if conditions are favorable (Pearse 1923).

Food Habits/Preferences: Aquatic insects, snails, small fish, tadpoles, mussels, carrion, and aquatic plants taken by foraging along the bottom. Diet usually about 50% vegetation.

Comments: Diurnal. Emerges from hibernation in late March or early April in Massachusetts (Graham 1971a).

Chrysemys p. picta and *Chrysemys picta marginata* intergrade in the Northeast.

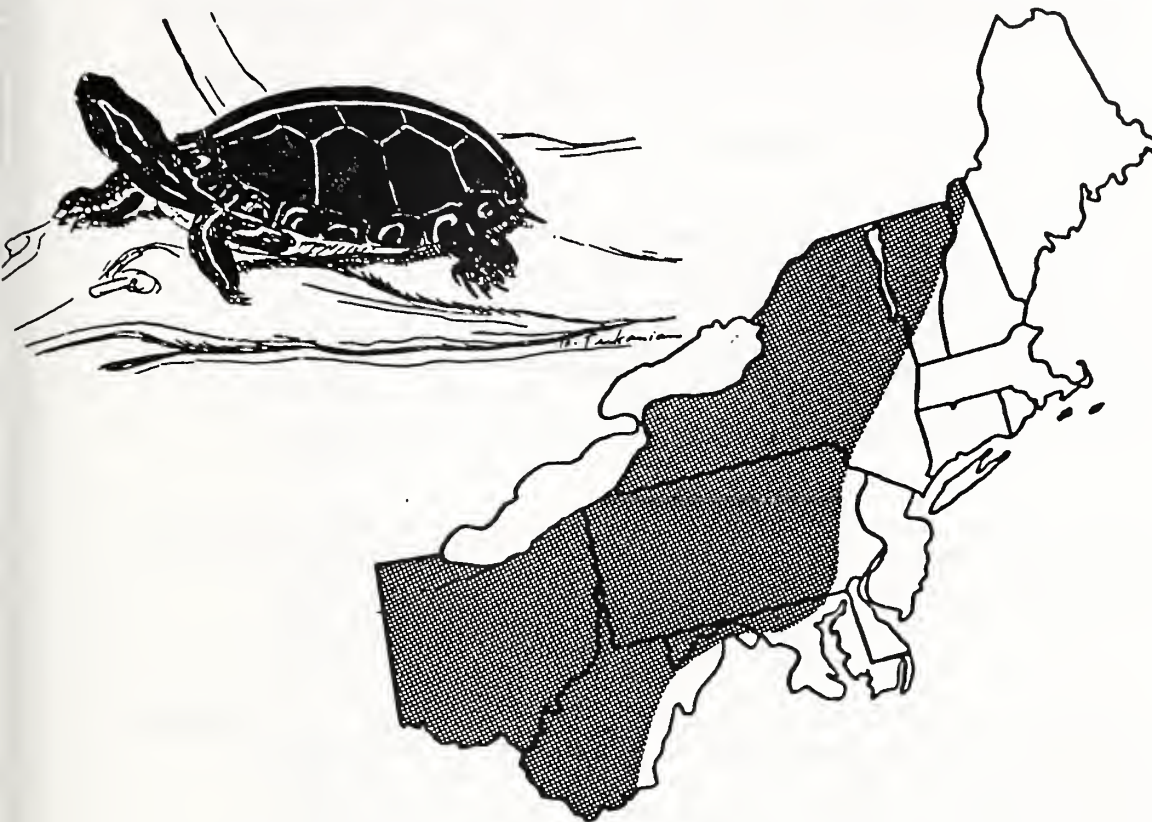
Selected References: Carr 1952, Gibbons 1968a, Ernst 1971, Ernst and Barbour 1972.

Midland Painted Turtle

Testudines

Chrysemys picta marginata

Emydidae



Range: New Hampshire, s. Quebec and Ontario to e. Wisconsin. Through c. Illinois south to Tennessee. Vermont and New York south to west of the Shenandoah River.

Relative Abundance in the Northeast: Abundant.

Habitat in the Northeast: Quiet water, preferably shallow areas with dense vegetation. Tolerant of some industrial pollution. Basks in groups on sunlit logs. Sometimes found away from water. Usually hibernates in muddy bottoms of ponds but has been reported active yearlong.

Special Habitat Requirements: Aquatic habitats.

Age/Size at Sexual Maturity: 5 years for males, 6 to 7 years for females (Pope 1939:185).

Breeding Period: Early spring after emerging from hibernation; fall matings have been reported.

Egg Deposition: June to July. Eggs often laid in high banks.

Clutch Size: 3 to 10 eggs, average 5 to 8.

Eggs Hatch: Hatchlings emerge in September or the next spring
(Smith 1961:140).

Home Range/Movement: Average summer movement within a pond about 90 m. Movements have been divided into three types: initial emigration in the spring of 63 to 144 m from hibernation ponds to other ponds, preferably with vegetation mats; late summer movements of 86 to 91 m, back to hibernation ponds; and late autumn movements of 88 to 130 m to deep water areas in Michigan (Sexton 1959). 60% of individuals studies in a Michigan lake exhibited homing behavior (Williams 1952).

Food Habits/Preferences: Aquatic vascular plants, seeds, algae and invertebrates including crustaceans, mollusks, insects and their larvae; and worms. Also takes carrion, fish, and frogs. Aquatic plants comprised more than 60% of the diet and insects about 20% in Michigan (Lagler 1943).

Comments: In New England there are no Midland turtle populations. Individuals are part of an intergrade swarm. Information provided in this account is based on references for *Chrysemys picta marginata* where intergrades do not occur. In New England, *Chrysemys picta marginata* and *Chrysemys p. picta* life history and habitat information are the same (M. Klemens, pers. commun.). Diurnal.

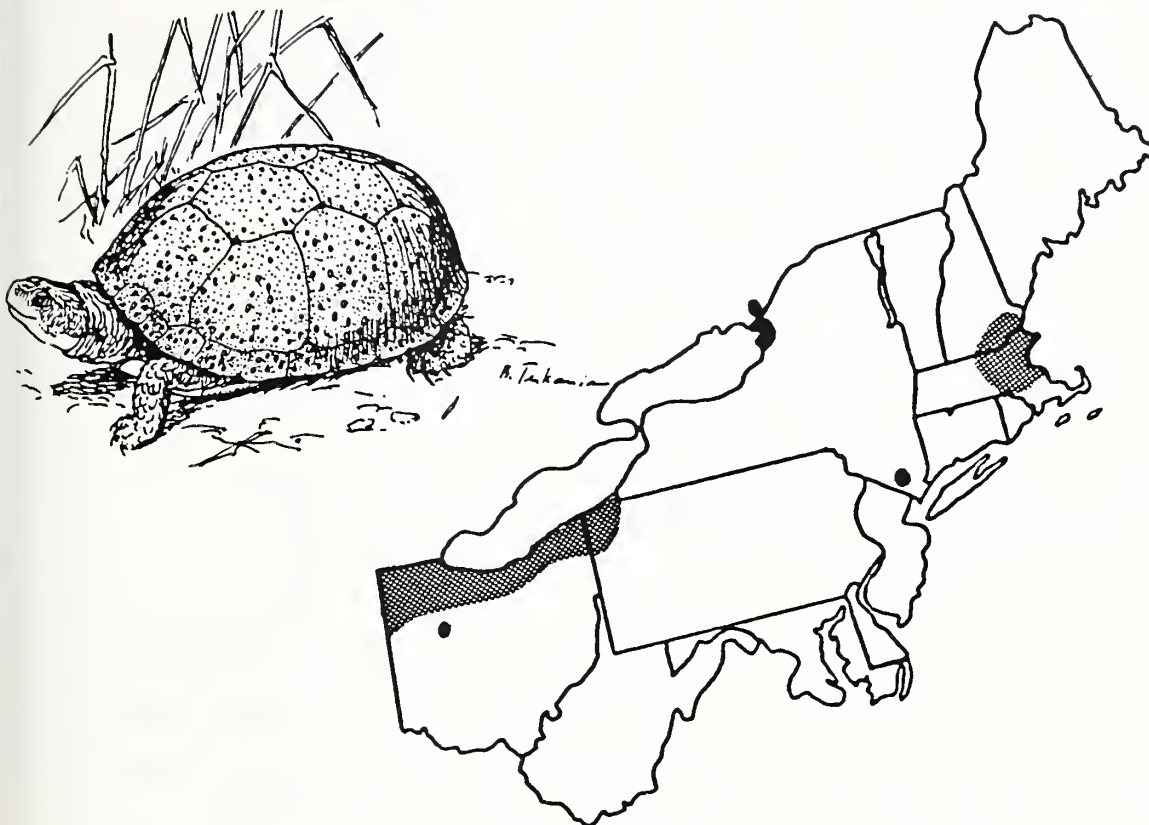
Selected References: Carr 1952, Sexton 1959, Smith 1961.

Blanding's Turtle

Emydoidea blandingi

Testudines

Emydidae



Range: In New England scattered colonies in New York, New Hampshire, and e. Massachusetts. Southern Quebec across the Lake States to c. Minnesota, south to Iowa and c. Illinois. Spotted occurrence from Nova Scotia to Ohio.

Relative Abundance in the Northeast: Populations localized and distribution spotty throughout its range (McCoy 1973:136.1). Generally scarce to rare, locally abundant in Massachusetts (Lazell 1972). An endangered species in Canada.

Habitat in the Northeast: Shallow waters preferred; marshes, bogs, ditches, ponds, swamps, also in protected coves and inlets of large lakes with abundant aquatic vegetation. In Michigan found in rivers (M. Klemens, pers. commun.). May wander overland. Basks on logs, stumps, banks. Active in winter or hibernates in mud or debris.

Special Habitat Requirements: Shallow waters.

Blanding's Turtle

Age/Size at Sexual Maturity: During 12th year for males with a plastron length of 181 to 190 mm, Massachusetts (Graham and Doyle 1977); males 131 to 190 mm in Michigan (Gibbons 1968b). Size differences between these two populations probably due to differences in food quality and availability (Graham and Doyle 1977).

Breeding Period: Early spring through October, most often from March to May (Ernst and Barbour 1972:181). Peak in late April (Graham and Depain, unpubl.).

Egg Deposition: June to July. Nests made in sandy soils.

Clutch Size: 6 to 11 eggs (Carr 1952:136), typically 8 to 9 eggs, clutches of 9, 13, and 16 eggs for Massachusetts females (Graham and Depain, unpubl.). Clutch of 17 for a July nesting female (Graham and Doyle 1979). Two clutches may be laid each season.

Incubation Period: Unreported.

Eggs Hatch: Autumn or next spring.

Home Range/Movement: Less than 100 m for 4 individuals in a marsh in s.w. Michigan (Gibbons 1968b).

Food Habits/Preferences: Crustaceans, insects, mollusks, fish, carrion, aquatic plants, succulent shoots and berries. Crustaceans and crayfish comprise about 56% of diet, insects over 25%, and other invertebrates and vegetable matter 25% (Lagler 1943).

Comments: Primarily diurnal.

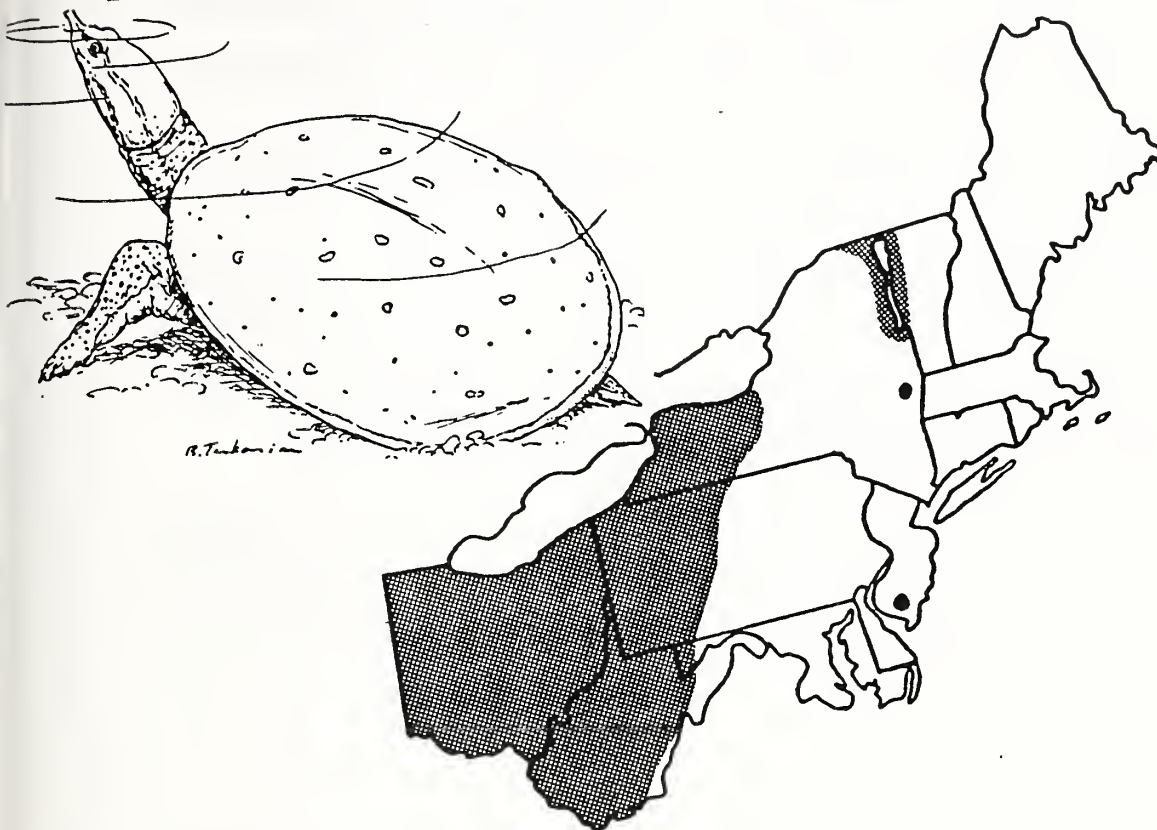
Selected References: Gibbons 1968b, McCoy 1973; Graham and Doyle 1977, 1979.

Eastern Spiny Softshell

Trionyx s. spiniferus

Testudines

Trionychidae



Range: Western New York across the Great Lakes States to the Mississippi River, n. Wisconsin south to the Tennessee River extending east to c. Pennsylvania. A disjunct colony occupies the Lake Champlain area. Introduces into the Maurice River system of New Jersey.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Aquatic, inhabiting large river systems. Also found in lakes and ponds. Intolerant of pollution from sewage, industrial or chemical wastes (Minton 1972:191). Basks on sand bars, mud flats, grassy beaches. Hibernates beneath 2 to 3 in (5.1 to 7.6 cm) of river bottom mud from October to April in the North.

Special Habitat Requirements: Shallow muddy bottoms for burrowing. Some aquatic vegetation essential (N. Green, pers. observ.).

Age/Size at Sexual Maturity: Females with plastron length of 180 to 200 mm, males at 90 to 100 mm.

Breeding Period: April or May.

Egg Deposition: May to August. Eggs laid in sandy soil or gravel beds near waters' edge.

Clutch Size: Typically 12 to 18, with a range of 4 to 32 eggs (Ernst and Barbour 1972:264).

Eggs Hatch: August to October or hatchlings overwinter in nest.

Home Range Size: Unreported.

Food Habits/Preferences: Chiefly carnivorous. Crayfish and insects are the major food items with tadpoles, frogs, mollusks, and fish eaten less frequently; vegetation and other plant materials also consumed.

Comments: Somewhat nocturnal.

Selected References: Ernst and Barbour 1972, Minton 1972, Webb 1973.

Northern Fence Lizard

Sceloporus undulatus hyacinthinus

Squamata
Lacertilia
Iguanidae



Range: New Jersey west to e. Kansas south to c. Texas and through c. Mississippi to South Carolina.

Relative Abundance in the Northeast: Rare, locally common in the New Jersey pine barrens.

Habitat in the Northeast: Dry, open, sunny woods. Found in brush piles, on fences, log piles, stumps, on buildings, usually near protective cover. Pine forests preferred, also found in oak-hickory and oak-pine forests (Minton 1972:197). Hibernates in underground burrows, rock crevices, in rotted wood, usually from October to April.

Special Habitat Requirements: Dry, sunny locations with cover.

Age/Size at Sexual Maturity: Breeds at 20 months in Colorado and Ohio (Tinkle and Ballinger 1972).

Breeding Period: April to May, after emergence from hibernation.

Egg Deposition: Late May to early August, in Maryland 8 weeks after breeding (Smith 1946:225).

Northern Fence Lizard

Clutch Size: 4 to 17 eggs, laid in ground, preferably in sandy soil or decaying stumps. 1 to 3 clutches may be laid per year (Tinkle and Ballinger 1972). Clutch size varies with geographic location.

Incubation Period: 10 weeks.

Eggs Hatch: Late summer to early fall (Tinkle and Ballinger 1972).

Home Range/Movement: Males defend small territories during breeding season--actual area unknown.

Food Habits/Preferences: Insects, spiders, millipedes, snails, pseudoscorpions, other small invertebrates. Favors ants (Cagle 1945, Hamilton and Pollock 1961).

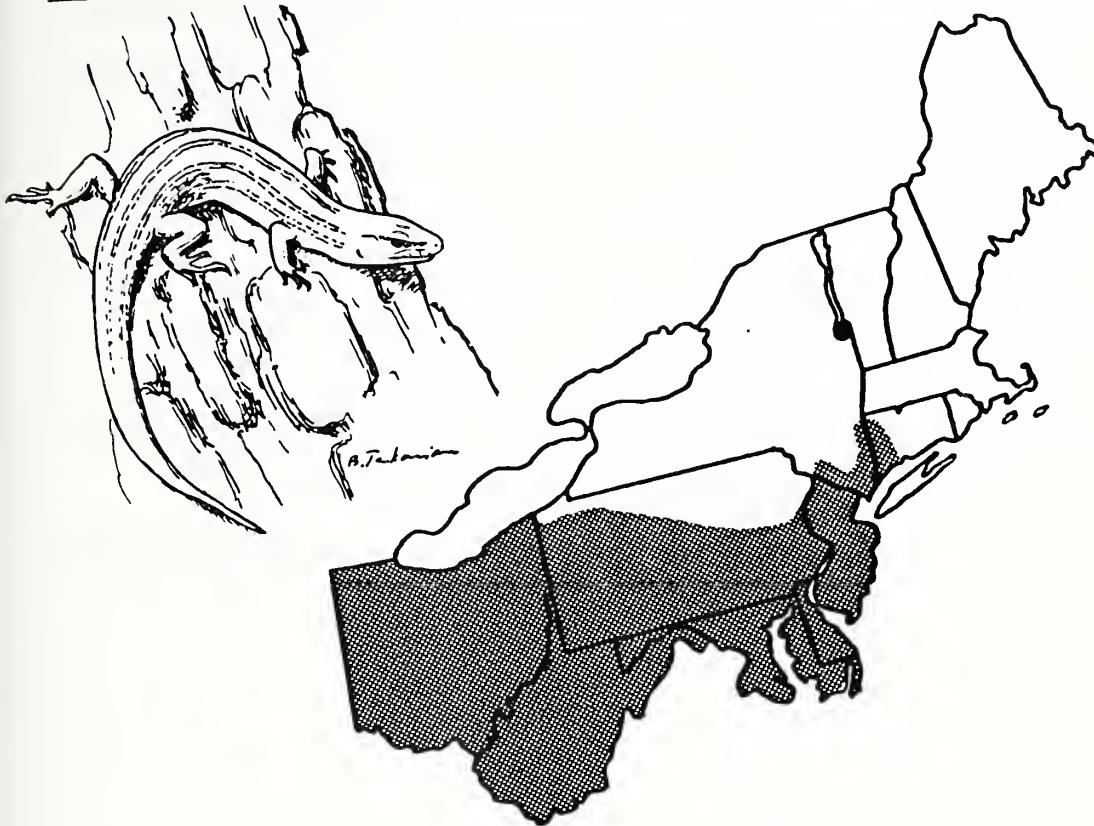
Comments: Arboreal and diurnal.

Selected References: Smith 1946, Smith 1961, Minton 1972.

Five-lined Skink

Eumeces fasciatus

Squamata
Lacertilia
Scincidae



Range: Southern end of Lake George, New York and s.e. New York south to n. Florida, west to c. Texas. Northern limit from Pennsylvania, Ontario to c. Wisconsin and n. Missouri.

Relative Abundance in the Northeast: Rare in Northeast through Connecticut, peripheral in New Jersey, presumed extinct in Massachusetts. Common in Pennsylvania, Maryland and West Virginia.

Habitat in the Northeast: Mesic wooded areas, open or moderately dense with ground cover. Most abundant around old buildings and open woods. Frequently in damp spots, under logs, rock piles, leaf litter, sawdust piles. Sums for brief periods on warm days (Smith 1946:349). Found on open talus slopes in mixed deciduous woodlands, New York. Primarily terrestrial but will climb snags to find insects. Hibernates from October until mid-March in decaying logs or below the frost line, underground or under large rocks.

Special Habitat Requirements: Open woods with logs and slash piles.

Age/Size at Sexual Maturity: After second hibernation.

Five-lined Skink

Breeding Period: May.

Egg Deposition: Typically in June or July, 6 to 7 weeks after breeding (Smith 1956:193). Eggs laid under rocks, logs, in rotted stumps, in loose soil.

Clutch Size: 4 to 20 eggs (Barbour 1971:209), typically 9 to 12.

Home Range/Movement: Males home range diameter about 90 ft (27.4 m), females about 30 ft (9.1 m), in e. Kansas (Fitch 1954 cited in Minton 1972:210). Individuals may remain in same home range or move after emerging from hibernation.

Food Habits/Preferences: Primarily insects and spiders, also snails, grubs, small vertebrates including young mice. Lizards occasionally eaten; will eat its own shed skin.

Selected References: Smith 1946, 1956; Barbour 1971.

Northern Coal Skink

Eumeces a. anthracinus

Squamata
Lacertilia
Scincidae



Range: Scattered populations in w. New York and Pennsylvania, Ohio, Virginias and Kentucky.

Relative Abundance in the Northeast: Uncommon.

Habitat in the Northeast: Damp wooded hillsides, near swamps, around wood piles, loose boulders, rotted logs. Will hide in shallow water. Prefers humid areas. Found in chestnut-oak-poplar woods (Smith and Smith 1952 cited in Minton 1972:331). West Virginia populations found in shale barrens (N. Green, pers. observ.).

Special Habitat Requirements: Humid areas with cover.

Age/Size at Sexual Maturity: Unreported.

Breeding Period: April to May in New York (Smith 1946:374).

Egg Deposition: June, guarded by female.

Clutch Size: 8 to 9 eggs.

Eggs Hatch: 4 to 5 weeks.

Home Range/Movement: Unreported.

Food Habits/Preferences: Insects and their larvae.

Comments: Diurnal.

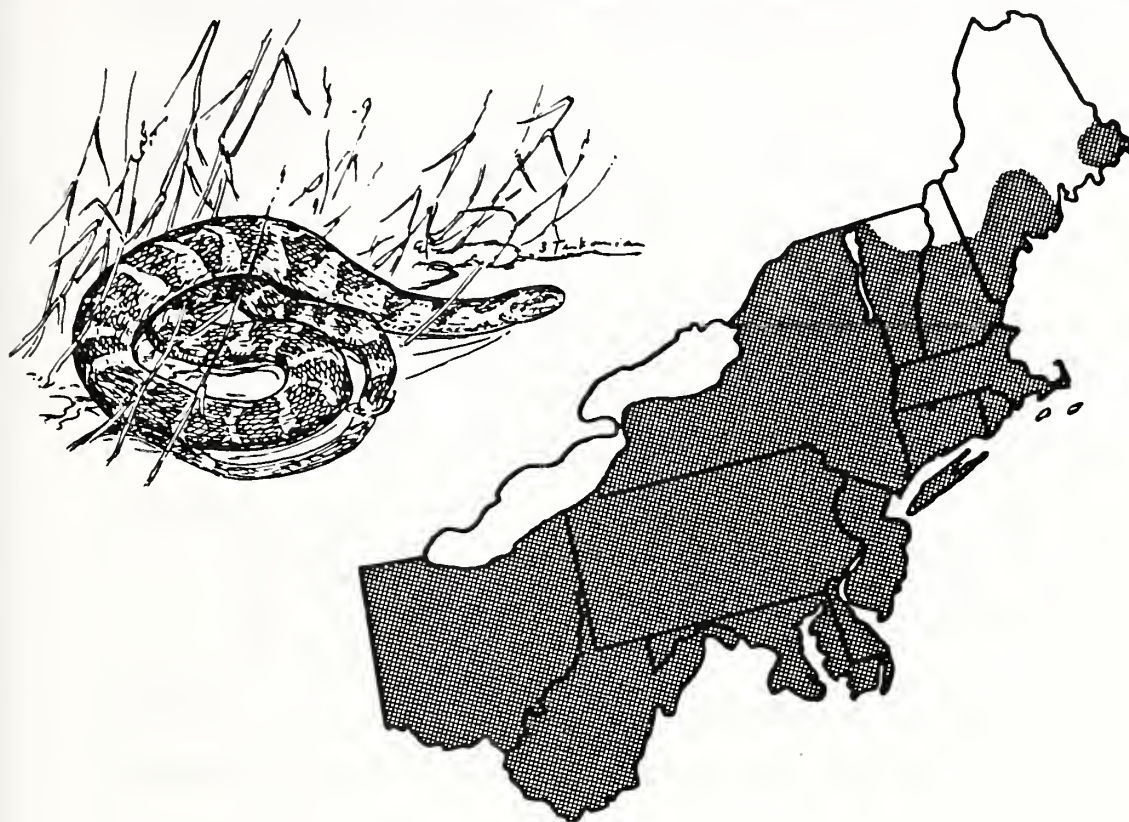
Selected References: Smith 1946.

Northern Water Snake

Nerodia s. sipedon

Serpentes

Colubridae



Range: Southern Maine, s. Ontario to n. Wisconsin, south through Kansas to e. Colorado, n. Oklahoma to c. Indiana, Kentucky, and Tennessee east to North Carolina and New England.

Relative Abundance in the Northeast: Abundant in suitable habitat.

Habitat in the Northeast: Aquatic and semi-aquatic habitats, favors spillways and bridges where rocks provide close cover, uncommon in deeply shaded woodland swamps and ponds, probably due to lack of basking sites (M. Klemens, pers. commun.). Found in the vicinity of rivers, brooks, wet meadows, ponds, swamps, bogs, old quarries. Inhabits salt or fresh water (Wright and Wright 1957:513), absent from heavily polluted waters. Prefers still or slow-moving water. Hibernates in crevices of rocky ledges, or in banks adjacent to water habitat.

Special Habitat Requirements: Branches or logs overhanging the water, or boulders of dams and caveways in reservoirs (T. Tynning, pers. commun.).

Age/Size at Sexual Maturity: Males 635 to 1,148 mm, females at 650 to 1,295 mm (Wright and Wright 1957:513).

Breeding Period: April to May and early fall.

Young Born: August to early October. Viviparous.

No. Young: 10 to 76 young, average 20 to 40. Larger females have larger litters.

Home Range/Movement: One individual moved 380 ft (115.8 m) along a river after 2 years (Stickel and Cope 1947). In large ponds at an Indiana fish hatchery, 80% were recaptured in the same pond, 89% were in the same pond or an adjacent pond. Snakes along streams had larger home ranges (Fraker 1970).

Food Habits/Preferences: Cold-blooded vertebrates: fish comprise 61% of food items, frogs and toads 21%, salamanders 12%; also insects, crayfish, recently dead fish (Uhler et al. 1939). Fish comprise over 95% of diet (Raney and Roecker 1947). May occasionally take shrews and mice.

Comments: Frequently found basking. Active both day and night.

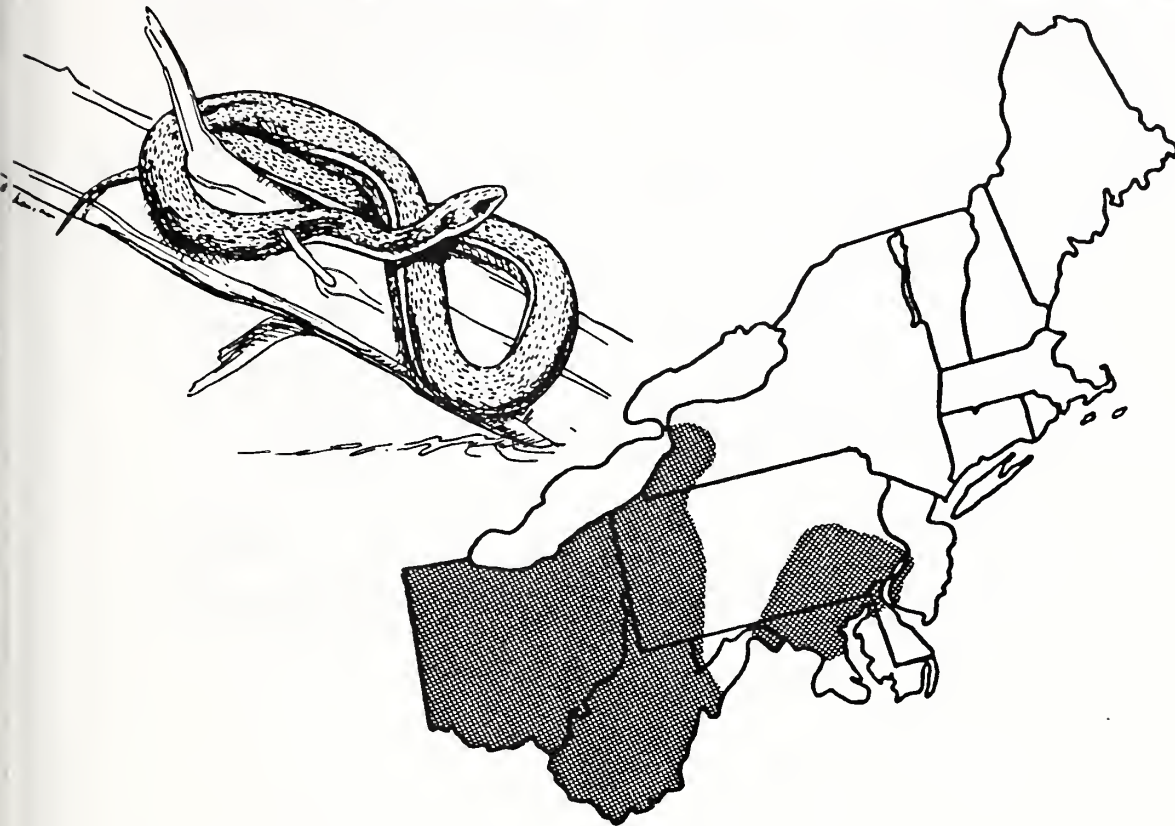
Selected References: Schmidt and Davis 1941, Wright and Wright 1957.

Queen Snake

Serpentes

Regina septemvittata

Colubridae



Range: Southwestern New York, s.e. Ontario, c. Michigan to s.e. Wisconsin, south to c. Mississippi, the panhandle of Florida and north through c. Georgia to s. Pennsylvania. Disjunct population in Missouri and Arkansas.

Relative Abundance in the Northeast: Locally abundant.

Habitat in the Northeast: Edges of small, clear, permanent streams, rivers and ponds in forested regions; also around canals, ditches, old quarries. Found in both swift and slow-moving waters. Found among aquatic plants, overhanging shrubs at shallow edges or among rocks and other debris at the water line. During summer months found in the water or under rocks (Wood 1949). Hibernates November to March in large aggregations, sometimes under rocks (Wright and Wright 1957:507).

Special Habitat Requirements: Aquatic habitats with moving water.

Queen Snake

Age/Size at Sexual Maturity: Summer after third hibernation (Wood 1949), males 375 to 692 mm, females 375 to 787 mm (Wright and Wright 1957:508).

Breeding Period: Soon after emergence in the spring, also during the fall in Michigan (M. Klemens, pers. commun.).

Young Born: 5 to 23 (Wood 1949), typically 10 to 12.

Home Range/Movement: Unreported.

Food Habits/Preferences: Recently molted crayfish taken almost exclusively (Raney and Roecker 1947), but occasionally toads, snails, small fish, newts, and insect larvae (Wright and Wright 1957:509).

Comments: Very aquatic; diurnal.

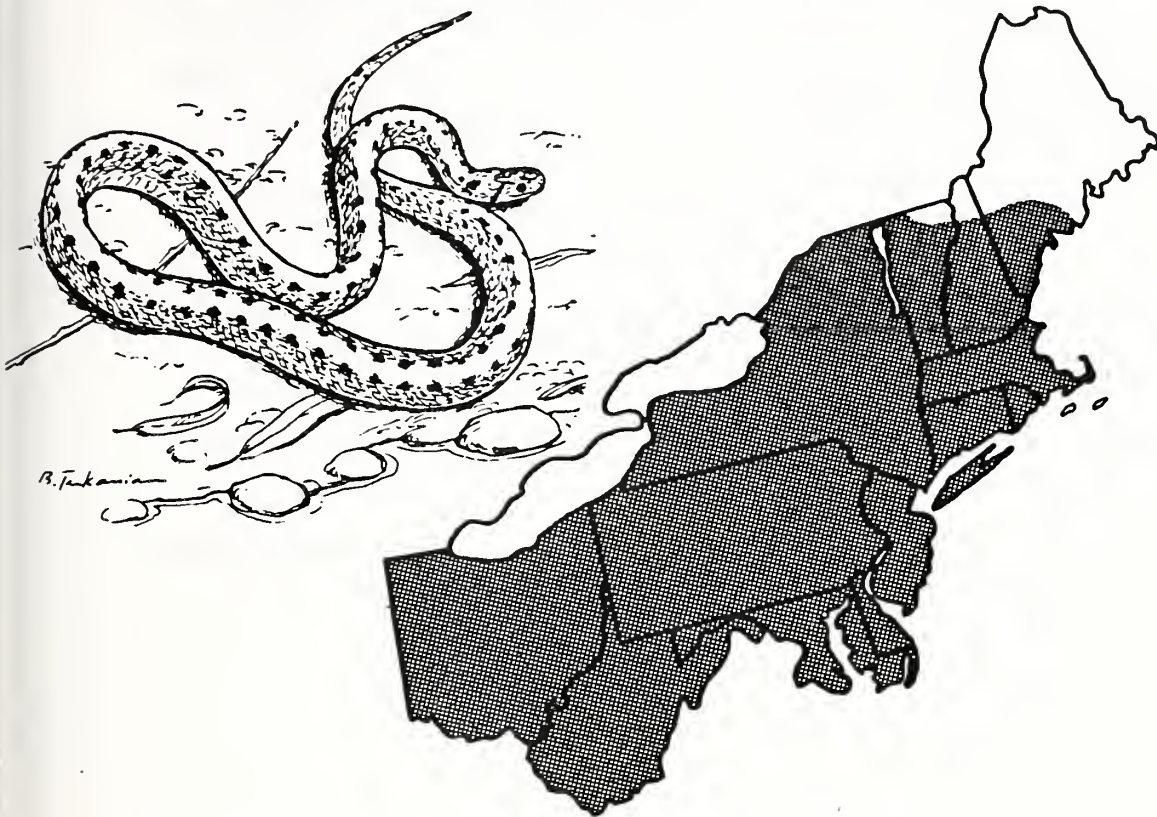
Selected References: Schmidt and Davis 1941, Wood 1949, Wright and Wright 1957.

Northern Brown Snake

Serpentes

Storeria d. dekayi

Colubridae



Range: Eastern U.S. from s. Maine and s. Canada west to Michigan, south to South Carolina. Range overlaps that of the Midland brown snake.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Ubiquitous, found in urban and rural areas, dry or moist situations, vacant lots, parks, trash piles. May be abundant along railroad tracks (T. Tynning, pers. commun.). In the wild found in damp woods, swamps, clearings, bogs, roadsides, open fields. Hides under stones, banks, logs, brush piles, leaves. Rare in old growth forests (J. Lazell, pers. commun.). Hibernates in large groups from October to November until March or April; may use ant hills or abandoned mammal burrows.

Age/Size at Sexual Maturity: At 2 years (Noble and Clausen 1936).

Breeding Period: Late March to April and possibly in the fall.

Young Born: Late July to August, at least 3 months after breeding (Wright and Wright 1957:701). Viviparous.

Northern Brown Snake

No. Young: 3 to 24 young (Smith 1956:283), typically 14.

Home Range/Movement: Average daily movement of 10 to 15 ft (3.0 to 4.6 m) on Long Island. Thirteen of 32 individuals displayed homing behavior (Noble and Clausen 1936).

Food Habits/Preferences: Slugs, snails, earthworms, insects, minnows, and tiny toads are occasionally eaten.

Comments: Formerly DeKay's snake. Commonly found in aggregations throughout the year (Noble and Clausen 1936). May appear to be scarce during July and August when it moves down into soil to lower temperature zones. Degree of fossorial tendency varies with microhabitat temperature preference (Elick et al. 1979). Active evening to early morning; one of the few New England snakes that is active at night.

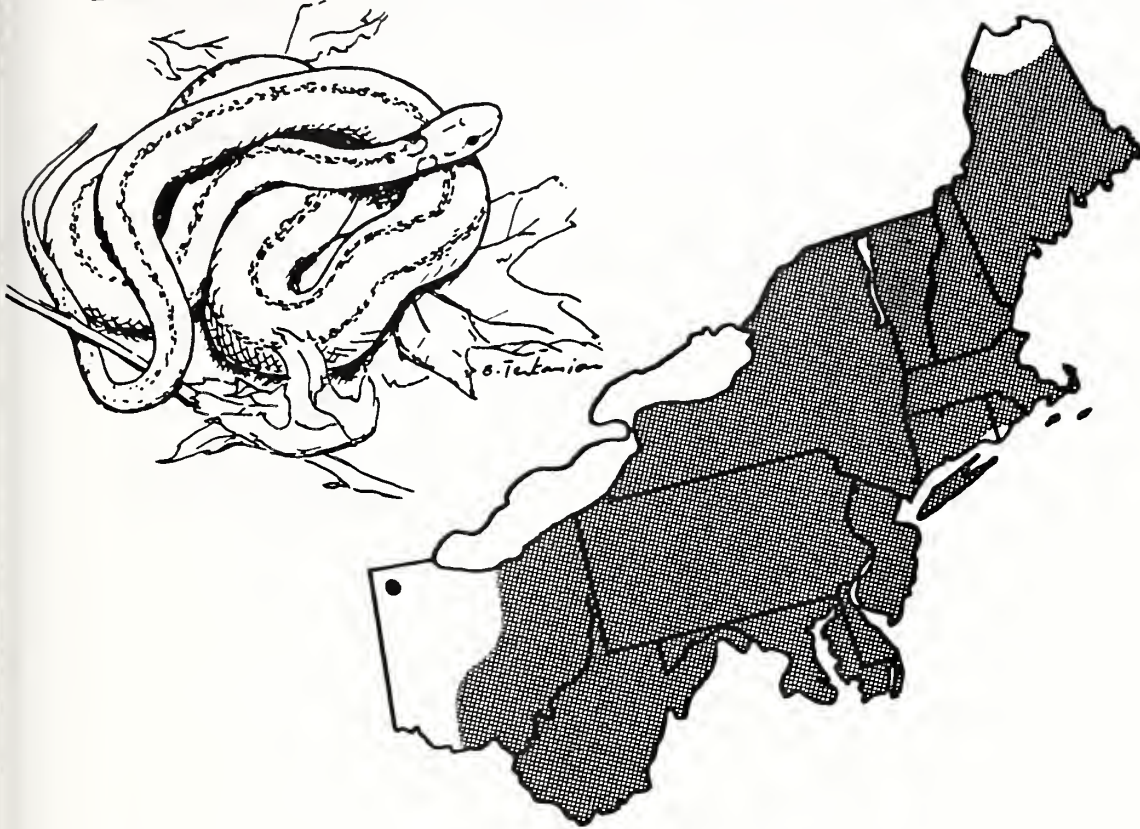
Selected References: Schmidt and Davis 1941, Wright and Wright 1957.

Northern Redbelly Snake

Serpentes

Storeria o. occipitomaculata

Colubridae



Range: Nova Scotia to s. Manitoba, south to e. Texas, Georgia, and throughout the e. U.S.

Relative Abundance in the Northeast: Locally abundant.

Habitat in the Northeast: Moist woods, hillsides, sphagnum bogs, upland meadows and valleys. Found under surface debris, also around abandoned buildings. Occurs at elevations from sea level to mountains. Prefers woodlands: pine, oak-hickory, aspen, hemlock groves (Wright and Wright 1957:717). More frequently found in upland woody ridges. Hibernates from fall to March or April. Active through mid-October in Connecticut (M. Klemens, pers. commun.).

Special Habitat Requirements: Woodlands.

Age/Size at Sexual Maturity: Males 182 to 359 mm, females 211 to 383 mm (Wright and Wright 1957:718), at 2 years (Blanchard 1937a).

Breeding Period: Probably after emerging from hibernation; a late summer or fall mating may also occur (Barbour 1971:287).

Northern Redbelly Snake

Young Born: August to September. Viviparous.

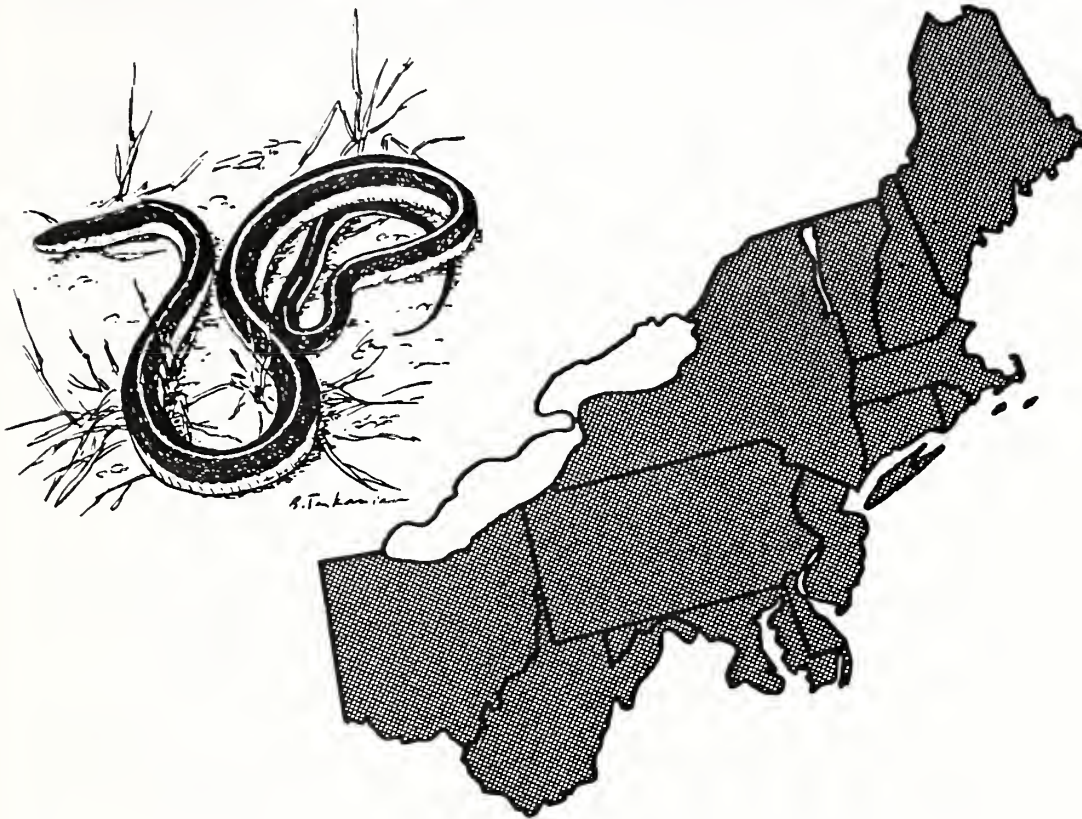
No. Young: 1 to 14 young (Blanchard 1937a), typically 7 to 8.

Home Range/Movement: 1 adult found 100 ft (30.4 m) from release point in Michigan after 7 days (Blanchard 1937a).

Food Habits/Preferences: Consumes slugs, earthworms, soft insects and larvae, sowbugs; occasionally small salamanders.

Comments: Has been found active at all times of day and evening.
Degree of fossorial tendency varies (Elick et al. 1979).
Young commonly mistaken for young ring-neck or Northern brown snakes.

Selected References: Schmidt and Davis 1941, Wright and Wright 1957, Barbour 1971.



Range: Nova Scotia to e. Manitoba south to e. Texas, and throughout the e. U.S.

Relative Abundance in the Northeast: Very abundant; most common and widespread snake.

Habitat in the Northeast: Ubiquitous, terrestrial; found in moist areas, forest edges, stream edges, fence rows, vacant lots, bogs, swamps, overgrown yards. Usually avoids thickly forested areas. One specimen found under a rock in a stream through a dark hemlock grove (M. Klemens, pers. commun.). Found in almost all damp environments, from river bottoms to mountain elevations.

Hibernates in holes, rock crevices, mud, anthills, rotted wood, uprooted trees, house foundations, and sometimes partially or completely submerged under streambed rocks, from October to March or April. One of the earliest snakes to emerge from hibernation.

Age/Size at Sexual Maturity: Females in second year, some males the second spring after birth (Carpenter 1952a). At 400 mm snout to vent length for males and 500 mm for females in Kansas (Fitch 1965:531).

Breeding Period: After emergence from hibernation in mid-March to May, also in fall before hibernation (Anderson 1956:169). Mates at or near hibernation site.

Young Born: July to early September. Gestation period of 3 to 4 months or longer in cooler climates (Blanchard and Blanchard 1942). Viviparous.

No. Young: 3 to 85 young, typically 14 to 40. Number of young correlated with size and age of female (Fitch 1965:558).

Home Range/Movement: Approximately 5 ac (2.0 ha), most ranges were smaller in cut-over agricultural fields in Indiana. Activity range* of about 2 ac (0.8 ha) in Michigan woodlands and open fields (Carpenter 1952a). Home ranges of 35.0 ac (14 ha) for males and 22.2 ac (9.1 ha) for females were found in mixed habitat in Kansas (Fitch 1965:538). Many individuals migrate from hibernacula to summer ranges.

Food Habits/Preferences: Earthworms comprise 80% of food items, also amphibians, carrion, fish, leeches, caterpillars, other insects, small birds, rodents (Carpenter 1952b); also slugs, other snakes, mollusks, crayfish, sowbugs (Hamilton 1951).

Comments: Diurnal but sometimes active at night (Minton 1972:250). Seeks cover under objects on hot summer days. Pesticides have reduced local populations in New York (Gochfeld 1975).

Selected References: Carpenter 1952b, Wright and Wright 1957, Fitch 1965.

*Defined as an area covered by an animal in the course of its day-to-day existence. Lacks definite home site or other center of activity (Carpenter 1952b:250).

Maritime Garter Snake

Serpentes

Thamnophis sirtalis pallidula

Colubridae



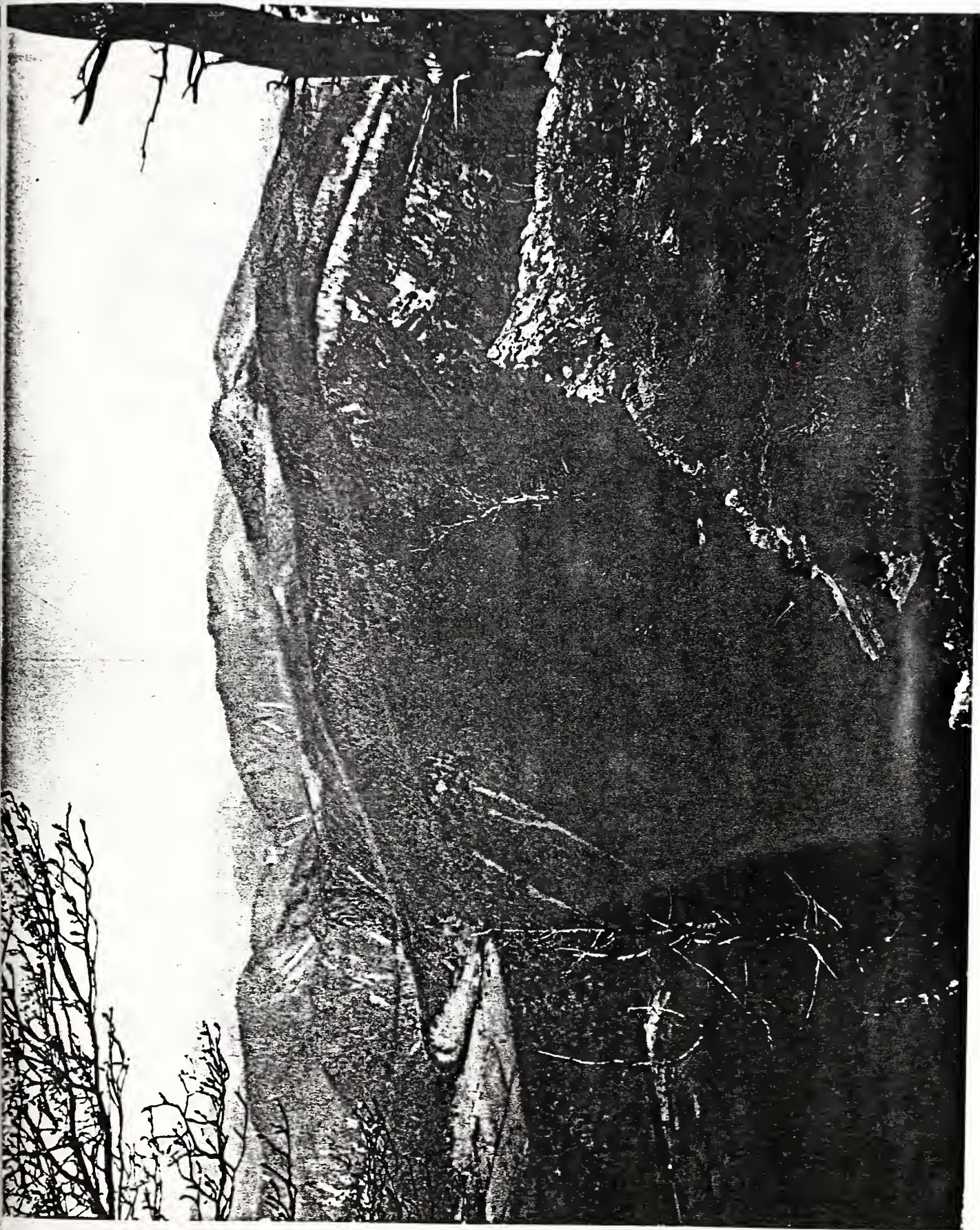
Range: Eastern Quebec extending to Alberta in discontinuous populations, south to n. New Hampshire, New York and n. Michigan. Intergrades with *T. s. sirtalis* to west and s. parts of range.

Relative Abundance in the Northeast: Unreported.

Habitat in the Northeast: Undocumented.

Comments: Little information available on life history.

Selected References: Bleakney 1959.



Shorthead Garter Snake

Thamnophis brachystoma

Serpentes

Colubridae



Range: The Allegheny High Plateau of extreme s.w. New York and n.w. Pennsylvania.

Relative Abundance in the Northeast: Abundant.

Habitat in the Northeast: Areas with brushy cover or piles of stones, creek borders, old fields, meadows; near or in water, uplands and lowlands. Prefers open herbaceous areas, may be occasionally found into the forest edge. Moist grassy areas and dry rocky slopes (Stewart 1961:78). Dry pastures to beaver pond marshes (Klingener 1957). Hibernacula for 13 individuals in New York was a shale outcropping on a bluff (Bothner 1963).

Special Habitat Requirements: Usually found near water.

Age/Size at Sexual Maturity: Males 290 to 440 mm, females 250 to 506 mm (Wright and Wright 1957:815).

Shorthead Garter Snake

Breeding Period: Unreported.

Young Born: August to September, Pennsylvania (Swanson 1952).
Viviparous.

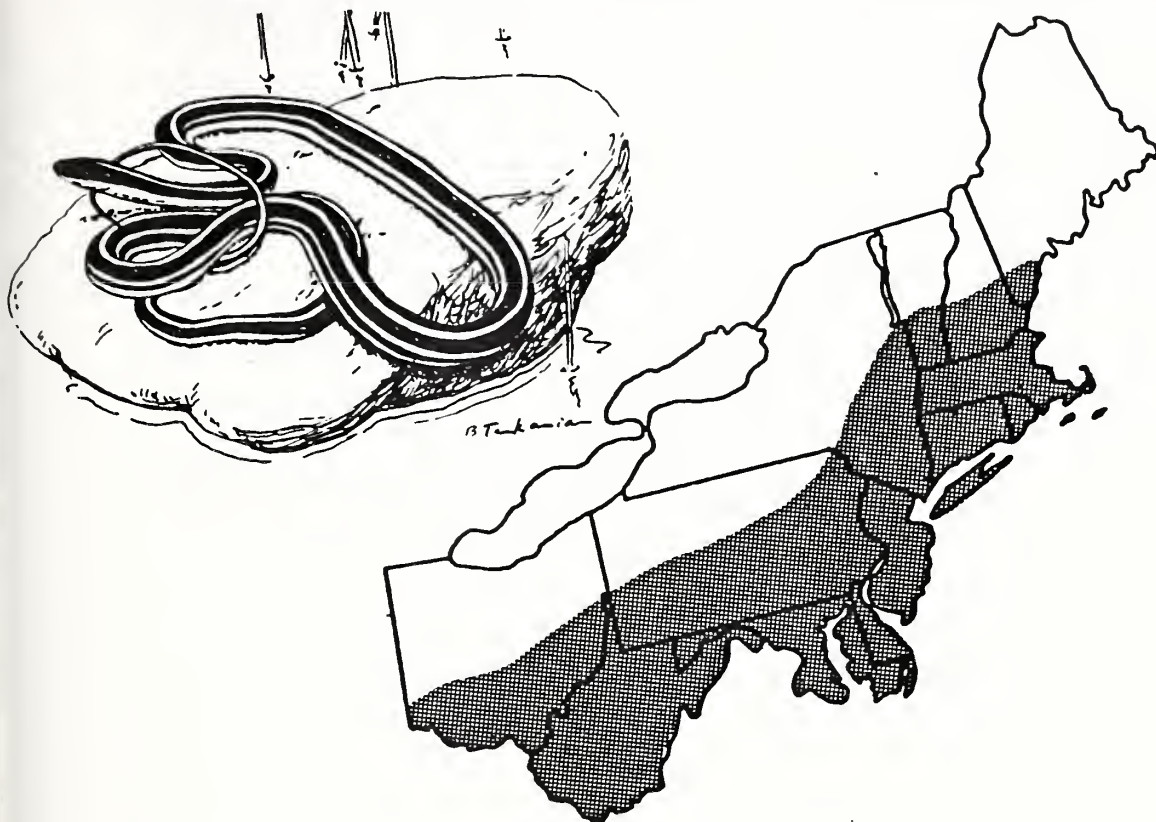
No. Young: 6 to 14 young, average 8 to 9 (Swanson 1952).

Home Range/Movement: Undocumented.

Food Habits/Preferences: Earthworms (Asplund 1963). Frogs, fish, toads, mice, earthworms, insects (Collins 1959:390).

Comments: Extremely docile and gregarious (Stewart 1951:78-79, Swanson 1952).

Selected References: Swanson 1952, Wright and Wright 1957, Bothner 1976.



Range: Southern Maine to South Carolina and the Florida panhandle. Southern Indiana south to e. Louisiana. Northern limits through s. Indiana to c. New England.

Relative Abundance in the Northeast: Generally common, but uncommon in Connecticut (M. Klemens, pers. commun.).

Habitat in the Northeast: Semi-aquatic, inhabiting stream edges, swampy areas, wet meadows, ponds, bogs, ditches. Prefers areas with brushy vegetation at waters' edge for concealment. Also in damp or wet deciduous or northern pine forests. Seldom far from cover (Carpenter 1952b). May escape higher ground temperatures in summer by seeking shelter in shrubs or underground. Hibernates from October to March (Wright and Wright 1957:825).

Special Habitat Requirements: Mesic woodlands with aquatic habitat.

Age/Size at Sexual Maturity: Females during second year (Carpenter 1952a), males 400 to 819 mm, females 451 to 900 mm (Wright and Wright 1957:825).

Eastern Ribbon Snake

Breeding Period: After emergence from hibernation.

Young Born: Late July to September, viviparous.

No. Young: 3 to 20, typically 10 to 12.

Home Range/Movement: Average activity range of about 2 ac (0.8 ha), approximately average distance traveled was 280 ft (85.3 m) in open Michigan grassland and marsh (Carpenter 1952b).

Food Habits/Preferences: Frogs, toads and salamanders comprise 90% of prey items; usually smaller or metamorphosing individuals were taken; also mice, spiders, minnows and some insects (Carpenter 1952b).

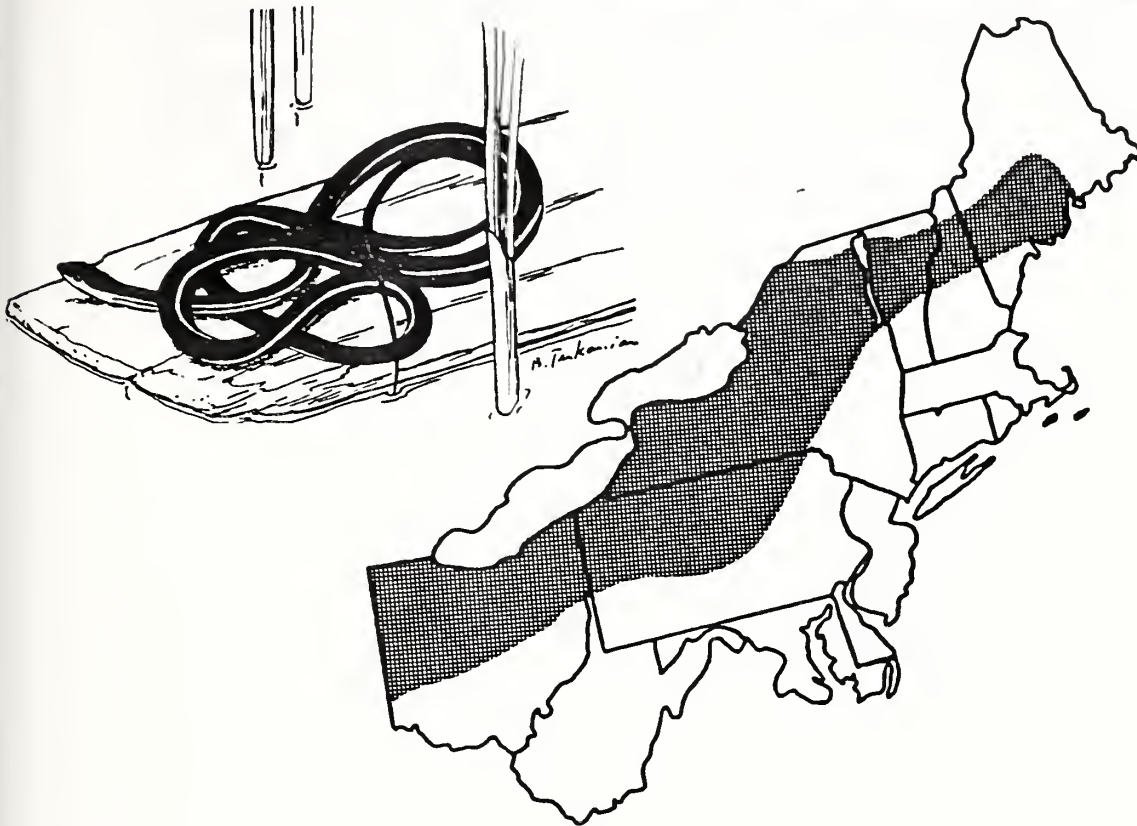
Selected References: Carpenter 1952b, Rossman 1970.

Northern Ribbon Snake

Serpentes

Thamnophis sauritus septentrionalis

Colubridae



Range: Central Maine west through n.w. New England and s. Ontario to Michigan, south to s.e. Illinois, Indiana, Ohio and n. Pennsylvania.

Relative Abundance in the Northeast: Rare.

Habitat in the Northeast: Sunny areas with low, dense vegetation that is near bodies of shallow quiet water. Damp meadows, grassy marshes, northern sphagnum bogs, borders of ponds, lakes and meandering creeks. Semi-aquatic. Probably hibernates October to March (Minton 1972:260).

Special Habitat Requirements: Shallow, permanent water in open, grassy habitat.

Age/Size at Sexual Maturity: Some females at almost 2 years (Carpenter 1952a).

Breeding Period: Probably spring and fall (Minton 1972:260).

Young Born: July to August (Minton 1972:260).

Northern Ribbon Snake

No. Young: 4 to 10 or 11 young (Minton 1972:260). Viviparous.

Home Range/Movement: Unknown.

Food Habits/Preferences: Frogs, salamanders, fish. Captives will eat minnows. Brown (1979) noted that 93% of the food items in 21 stomachs were comprised of anurans.

Comments: Diurnal.

Selected References: Minton 1972, Conant 1975.



Range: Northern New Jersey west to s. Ohio and e. Kentucky, south to Alabama and the Florida panhandle and n. Florida. Absent from the Appalachian highlands.

Relative Abundance in the Northeast: Locally common, rare in New Jersey.

Habitat in the Northeast: Abandoned fields, open wooded hillsides, trails and woodland roads. Has also been found in vacant lots, dry deciduous and pine woods, wet meadows, woodland pastures. Hides under boards, trash, logs, sun-warmed stones. Hibernates during fall and winter months.

Special Habitat Requirements: Open habitat in woodlands or fields.

Age/Size at Sexual Maturity: Males 190 to 255 mm, females 183 to 280 mm (Wright and Wright 1957:291).

Breeding Period: Probably early spring (Barbour 1971:283).

Young Born: Late July to August (Barbour 1971:283). Viviparous.

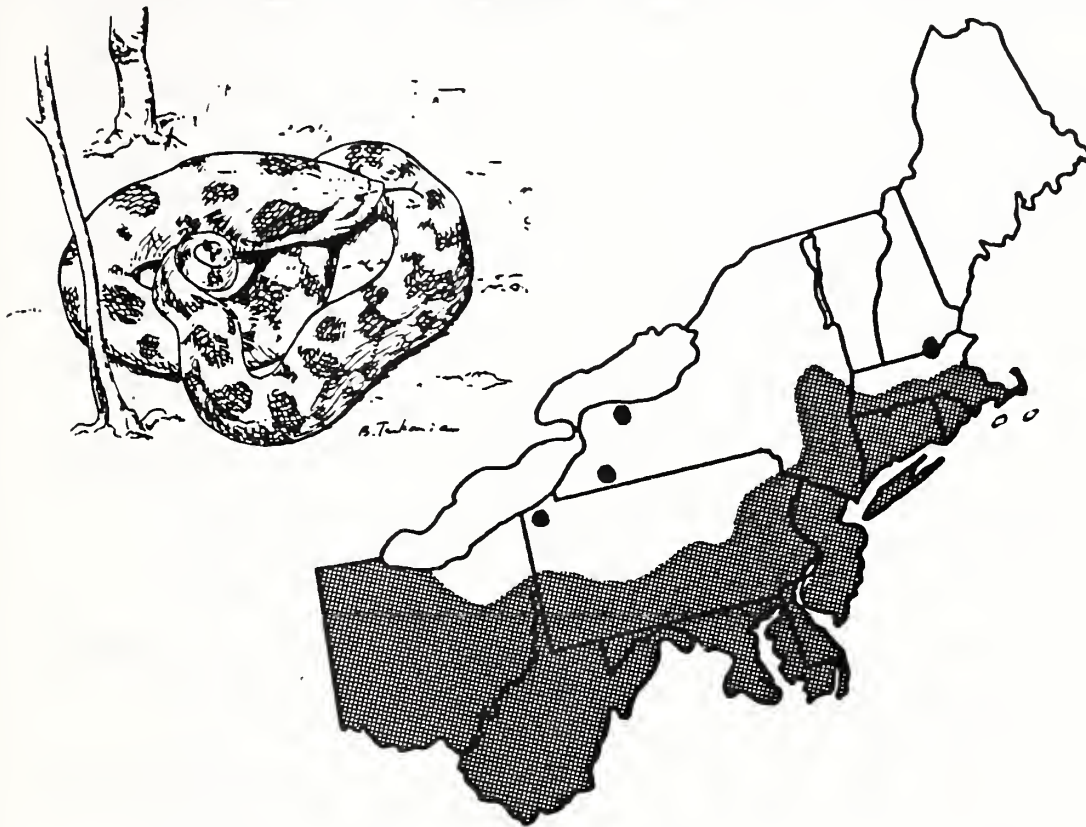
No. Young: 7 to 10 (Wright and Wright 1957:291).

Home Range/Movement: Undocumented.

Food Habits/Preferences: Earthworms, snails, soft-bodied insects and their larvae and other small arthropods.

Comments: Secretive, nocturnal and semi-fossorial. Seldom seen above ground in the North except after heavy, cool rains.

Selected References: Wright and Wright 1957.



Range: Cape Cod and c. Massachusetts west to Ohio, s. Ontario, c. Minnesota, and s.e. South Dakota, south to c. Texas and s. Florida.

Relative Abundance in the Northeast: Locally common.

Habitat in the Northeast: Where sandy soils predominate, such as beaches, open fields, dry, open pine or deciduous woods. Has been found on hillsides, farm fields and around outbuildings. In Pennsylvania most frequently found in upland situations, intermountain and river valleys (McCoy and Bianculli 1966). Low-lying areas of Connecticut (M. Klemens, pers. commun.), and in marshy woodlands in the Albany Pine Bush in New York, and wooded creek bottomlands (M. Stewart, pers. commun.). Hibernates from late September to April or May under forest floor debris, stumps, trash piles (Wright and Wright 1957:308).

Special Habitat Requirements: Sandy soils, open woodlands.

Age/Size at Sexual Maturity: Males 400 to 1,050 mm, females 450 to 1,200 mm (Wright and Wright 1957:309).

Breeding Period: April to May.

Egg Deposition: June to July. Eggs laid in earth, under or in pulpy wood of decaying logs.

Clutch Size: 4 to 42 eggs (Edgren 1955), typically 25.

Incubation Period: 39 to 60 days (Anderson 1965:185).

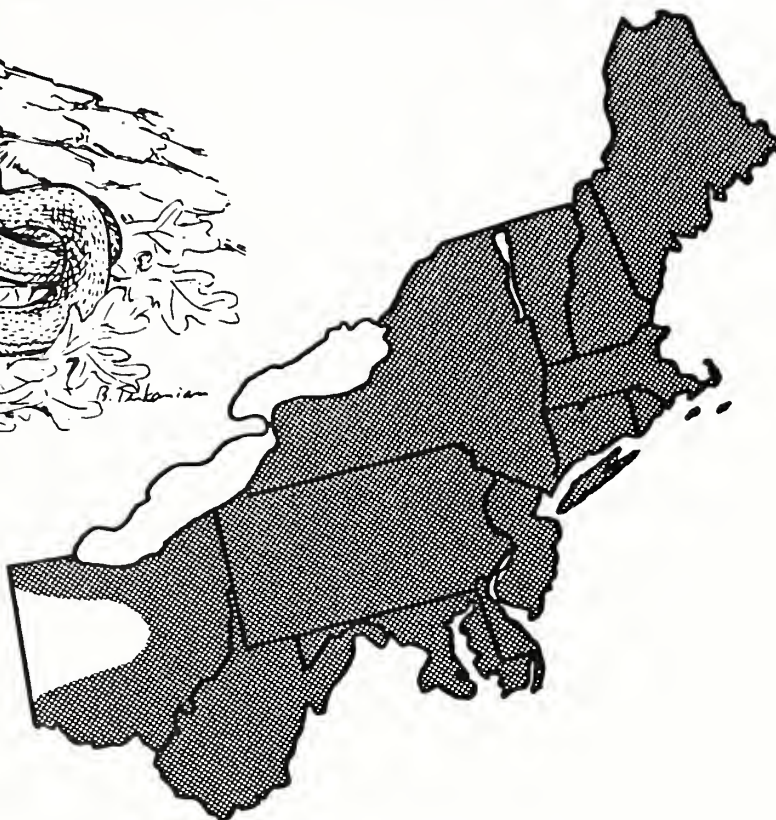
Eggs Hatch: July to September, peak in August.

Home Range/Movement: After 5 months one individual in Maryland mixed habitat had moved 100 ft (Stickel and Cope 1974).

Food Habits/Preferences: Toads preferred, but frogs, fish, salamanders, insects and worms are taken; rarely small birds and mammals and occasionally other snakes (Edgren 1955). Amphibians and reptiles comprised 80% of the food items in 10 specimens in Virginia (Uhler et al. 1939).

Comments: Diurnal. Particularly vulnerable to heavy herbicide and pesticide use. Defense behavior includes feigning death, mock striking and head rearing, and "hood" display.

Selected References: Edgren 1955, Smith 1956, Wright and Wright 1957, McCoy and Bianculli 1966.



Range: Nova Scotia, s. Ontario to Wisconsin. Eastern and s. Ohio to s.e. Illinois, n.e. Alabama and north through c. Virginia to New England.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Secretive, found under cover especially in moist shady woodlands with abundant hiding cover: stony woodland pastures, rocks, stone walls, old woodland junk piles, logs, debris, loose bark of logs and stumps, and boards are all used as cover. Hibernates from September to April or May. One individual found in a woodchuck den (Grizzel 1949).

Special Habitat Requirements: Mesic areas with abundant cover.

Age/Size at Sexual Maturity: Males at 13 to 14 months (Fitch 1960b), males 220 to 500 mm, females 220 to 550 mm (Wright and Wright 1957:187).

Breeding Period: Soon after emerging from hibernation.

Egg Deposition: Late June to early July. Eggs laid in rotted logs, under logs or stones. Several females may use the same nest.

Clutch Size: 1 to 10 eggs, typically 3 or 4 (Blanchard 1937b).

Incubation Period: 4 to 6 weeks (Minton 1944). Average of 56 days in laboratory conditions (Blanchard 1930 cited in Wright and Wright 1957:188).

Eggs Hatch: Late August through September.

Home Range/Movement: Undocumented.

Food Habits/Preferences: Toads, frogs, salamanders, earthworms, lizards, small snakes, insects, grubs.

Comments: Nocturnal. Degree of fossorial tendency varies with temperature preference (Elick et al. 1979).

Selected References: Schmidt and Davis 1941, Wright and Wright 1957.



Range: Southcentral Massachusetts, s.e. New York through c. Pennsylvania to s. Ohio. South to c. Alabama, n. Georgia and South Carolina.

Relative Abundance in the Northeast: Locally abundant.

Habitat in the Northeast: Dry to moist forests, often near streams; in the loose soil of gardens or weedy pastures. Sandy areas favored (M. Klemens, pers. commun.). Found in dry oak/pitch pine areas in Springfield, Massachusetts (T. Tynning, pers. commun.) and under loose bark slabs, logs, stones, leaves, other debris. Fossorial; has extended periods of inactivity. Hibernates in rotting wood, underground, or in burrows of other animals. Remains underground until May except for warm sunny days.

Special Habitat Requirements: Loose soils for burrowing or covering objects.

Age/Size at Sexual Maturity: Undocumented.

Breeding Period: Probably spring to early summer (McCauley 1945:97).

Egg Deposition: Late June to early July. Eggs probably laid in depressions under boulders or in hollow logs.

Clutch Size: 2 to 8 eggs (Wright and Wright 1957:106), typically 5 (McCauley 1945:55).

Eggs Hatch: August to September.

Home Range/Movement: About 1/4 ac (0.1 ha) in Kentucky (Barbour 1971:240). Average for 10 individuals in a forested mountainous area of Kentucky was 253 m² (Barbour et al. 1969a).

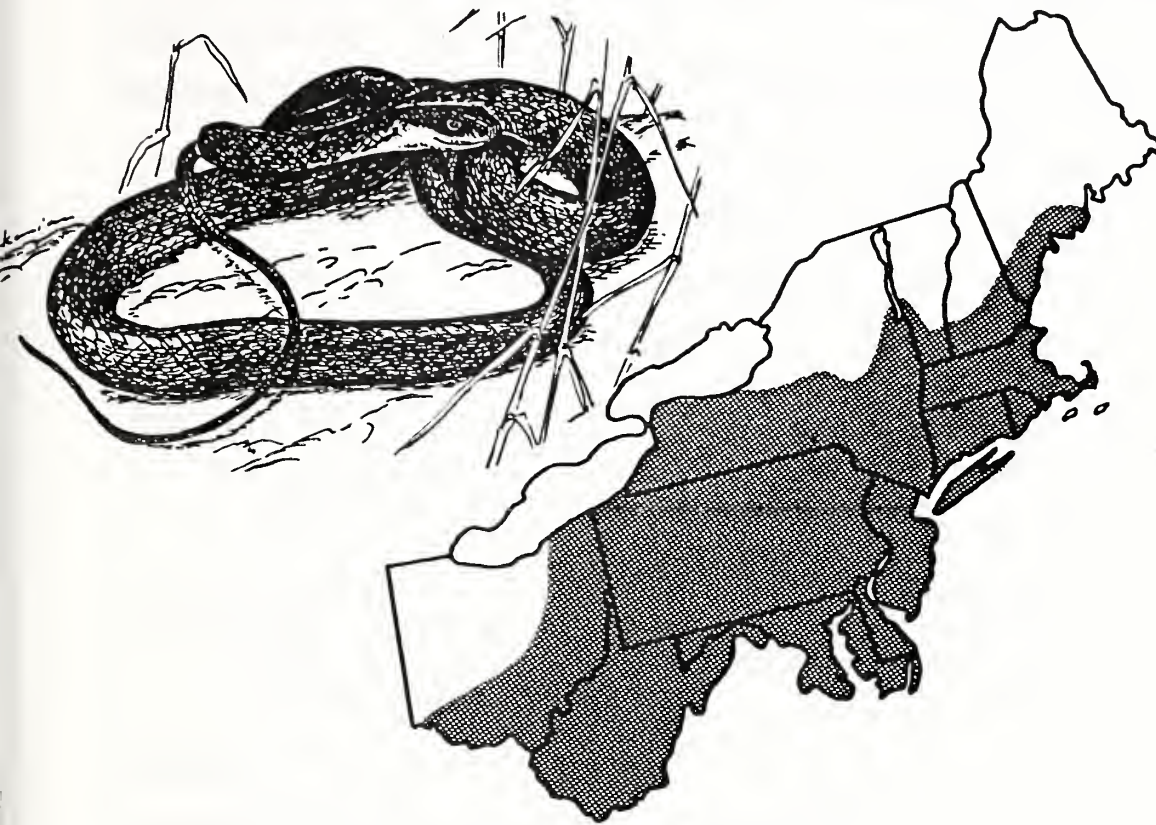
Food Habits/Preferences: Earthworms, soft-bodied insects and their larvae, grubs or slugs.

Comments: Nocturnal and secretive.

Selected References: Schmidt and Davis 1941, Wright and Wright 1957, Barbour, Harvey and Hardin 1969a.

Northern Black Racer
Coluber c. constrictor

Serpentes
Colubridae



Range: Southern Maine to s.w. Ohio, south to c. Alabama to South Carolina and throughout the e. U.S.

Relative Abundance in the Northeast: Locally abundant.

Habitat in the Northeast: Moist or dry areas, forests and wooded areas, fields, roadsides, swamps, marshes, clearings, near old buildings, trap rock ridges (M. Klemens, pers. commun.), stone walls and farms. Has been found in deciduous and pine forests. Partially arboreal.

Hibernates in large congregations, sometimes with copperheads and rattlesnakes, often using deep rock crevices or abandoned woodchuck holes. Probably the first snake to emerge from hibernation.

Age/Size at Sexual Maturity: Males at 13 to 14 months (Fitch 1960b), males 680 to 1,595 mm, females 710 to 1,683 mm (Wright and Wright 1957:135).

Breeding Period: May to early June.

Egg Deposition: June to early July. Laid in rotting wood, stumps, decaying vegetable matter, loose soil.

Clutch Size: 7 to 31 eggs, typically 16 to 17, clutch size proportional to size of female (Fitch 1963:420).

Incubation Period: 43 to 73 days in captivity (Fitch 1963:423).

Eggs Hatch: Late August to September.

Home Range/Movement: Very territorial; appears to have definite home range (Smith 1956:239). Average distance of 903 ft (275.2 m) in mixed Maryland habitat for 3 individuals after 2 years (Stickel and Cope 1947). Requires large tracts of mixed old fields and woodlands (M. Klemens, pers. commun.).

Food Habits/Preferences: Varied diet includes small mammals 25%, insects, frogs, toads, small birds, bird's eggs, snakes 25% and lizards (Uhler et al. 1939). Small mammals and insects 50% of diet (Surface 1906).

Comments: Diurnal.

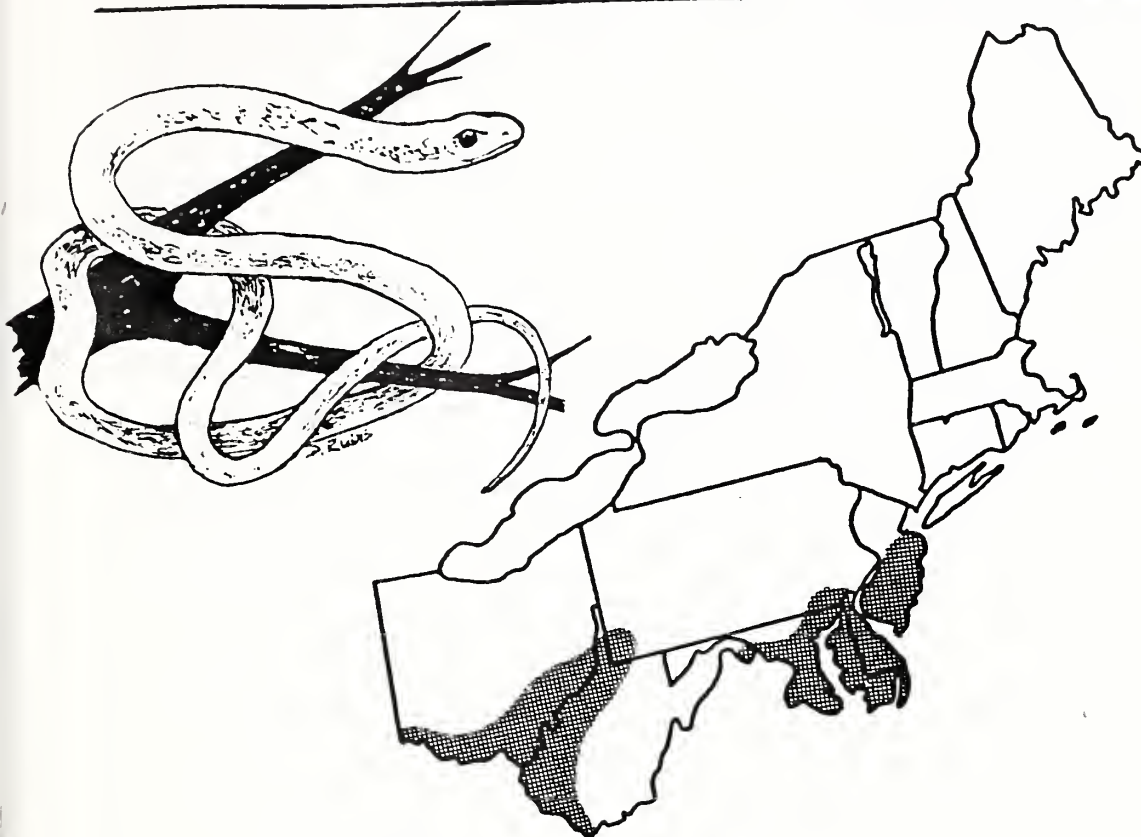
Selected References: Fitch 1963, Wilson 1978.

Rough Green Snake

Serpentes

Opheodrys aestivus

Colubridae



Range: Central New Jersey west to Kansas, south to the Florida Keys and Texas to Tampico, Mexico. Absent from the Appalachians of the Virginias.

Relative Abundance in the Northeast: Unknown.

Habitat in the Northeast: Arboreal, found in dense vegetation of stream or lake margins. Often enters shallow water. A forest edge species. Deciduous and coniferous forests, fields, marshes, back roads. Moist grassy meadows and fields in Virginia, often found under stones and logs (Martof et al. 1980:225). Sea level to 5,000 ft (1,500 m) (Behler and King 1979:640).

Special Habitat Requirements: Cover to provide arboreal escape.

Age/Size at Sexual Maturity: 1 to 2 years.

Breeding Period: Spring and fall. Breeding may be in arboreal situations.

Egg Deposition: June to August.

Clutch Size: 3 to 14.

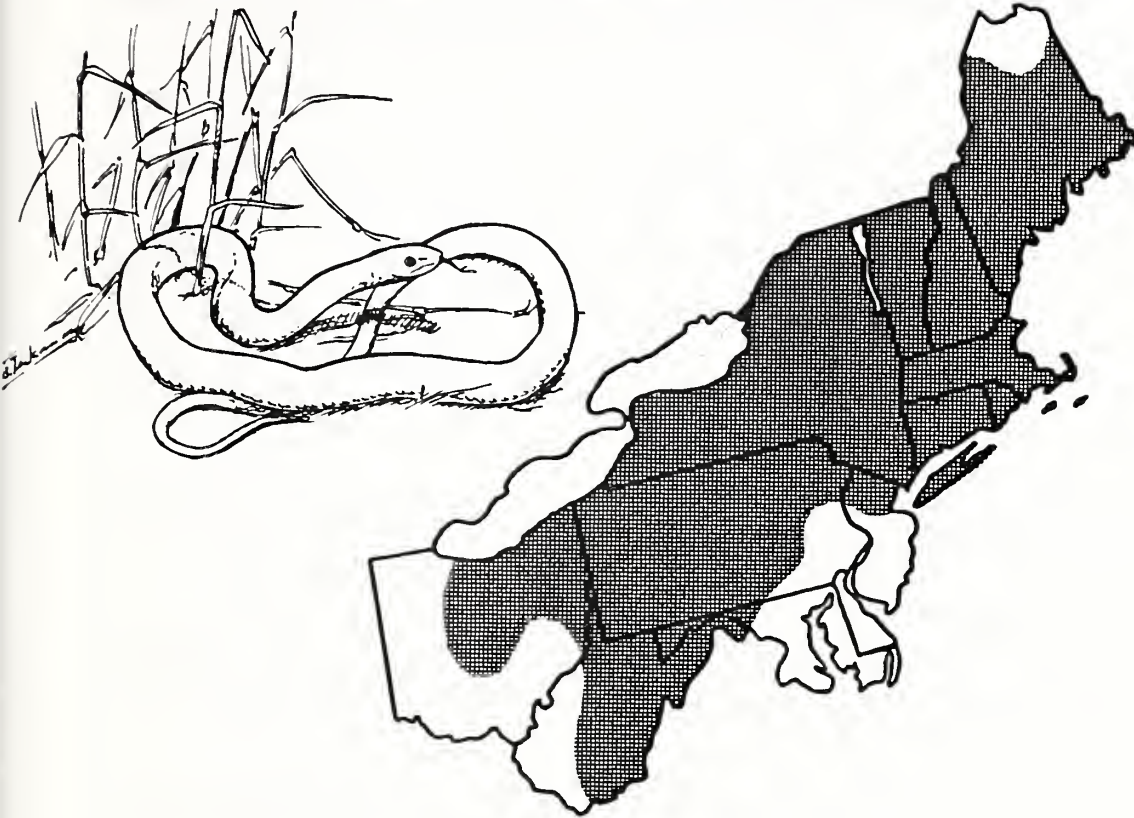
Incubation Period: 5 to 12 weeks.

Eggs Hatch: Early fall in Virginia (Martof et al. 1980:225).

Home Range/Movement: Unreported.

Food Habits/Preferences: Crickets, grasshoppers, larvae of moths and butterflies, slugs, millipedes, spiders and small salamanders.
Forages amid vines or shrubs, under stones, logs.

Selected References: Minton 1972.



Range: Nova Scotia, s. Ontario, into c. Minnesota to s. Wisconsin, Michigan, n.e. Ohio to the Appalachians of Virginia and West Virginia and north from c. New Jersey throughout New England with the possible exception of n. Maine.

Relative Abundance in the Northeast: Common, but currently declining in s. New England, New Jersey and Michigan.

Habitat in the Northeast: Upland areas, grassy fields, mountain meadows; high altitude areas with grassy, open spots. Also found in open aspen stands, sphagnum bogs, marshes, in vines and brambles, and hardwood stands. Abandoned farmland dominated by successional vegetation and debris (man-made) on Long Island, New York (Schlauch 1975).

Special Habitat Requirements: Upland grassy openings.

Age/Size at Sexual Maturity: Probably second year (Seibert and Hagen 1947).

Breeding Period: Late August in Ontario (Smith 1956:236). Spring and late summer (Behler and King 1979:640).

Egg Deposition: Late July to August.

Clutch Size: 3 to 12 eggs (Wright and Wright 1957:558), typically 7 (Blanchard 1933). Nest sites may be used by several females.

Incubation Period: Varies from 4 to 23 days (Blanchard 1933).

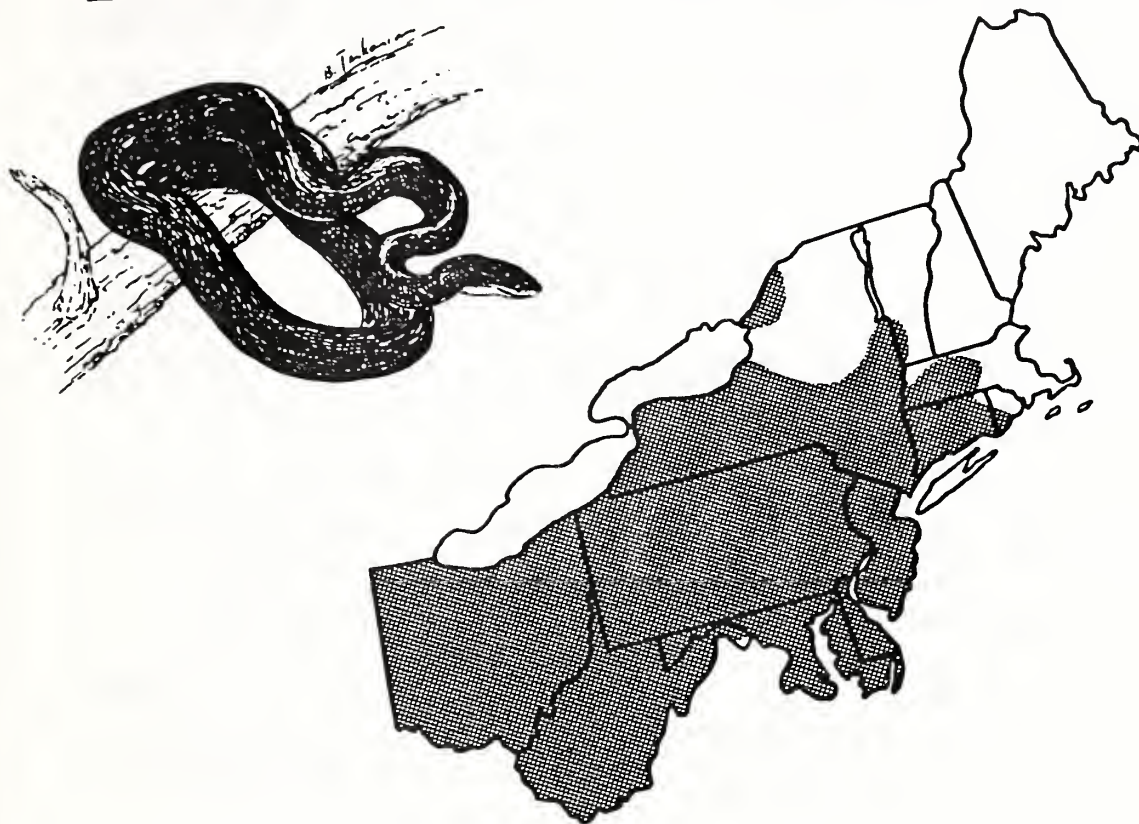
Eggs Hatch: August to early September.

Home Range/Movement: Less than 30 yd (27.4 m) for 10 of 12 individuals studied in an uncultivated field in Illinois (Seibert and Hagen 1947).

Food Habits/Preferences: Insects comprise 73% of prey items, also spiders snails (Surface 1906). Salamanders, millipedes, centipedes, particularly caterpillars, orthopterans, ants, flies (Uhler et al. 1939).

Comments: Hibernates early fall to April or May. Population decline may be related to insecticide spraying and loss of open fields and pasture.

Selected References: Schmidt and Davis 1941, Seibert and Hagen 1947, Wright and Wright 1957.



Range: Southwestern New England west through s. New York to s.c. Illinois, and the Mississippi River area in Wisconsin, south to Oklahoma, c. Louisiana and Georgia. Range may be extending northward in the Connecticut River Valley (T. Tying, pers. commun.).

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Variety of habitats including woodlands, thickets, field edges, farmlands, rocky hillsides and mountaintops, river bottoms, old barns. Readily climbs trees. Found in dry oak and oak-hickory woods, and mesic bottomland forests, may occur in very dense woods (Wright and Wright 1957:232). In Connecticut found in gorges and some coastal areas (M. Klemens, pers. commun.).

Hibernates late November to April, may use talus slopes, cisterns or unused wells. Often found in groups with copperheads and rattlesnakes where these snakes occur.

Age/Size at Sexual Maturity: Males 1,095 to 1,835 mm, females 715 to 1,800 mm (Wright and Wright 1957:233).

Black Rat Snake

Breeding Period: May to June.

Gestation Period: 8 to 12 weeks (Oliver 1955:243).

Egg Deposition: July to August. Laid in loose soil, decaying wood, manure piles, sawdust piles.

Clutch Size: 6 to 24 eggs, typically 14.

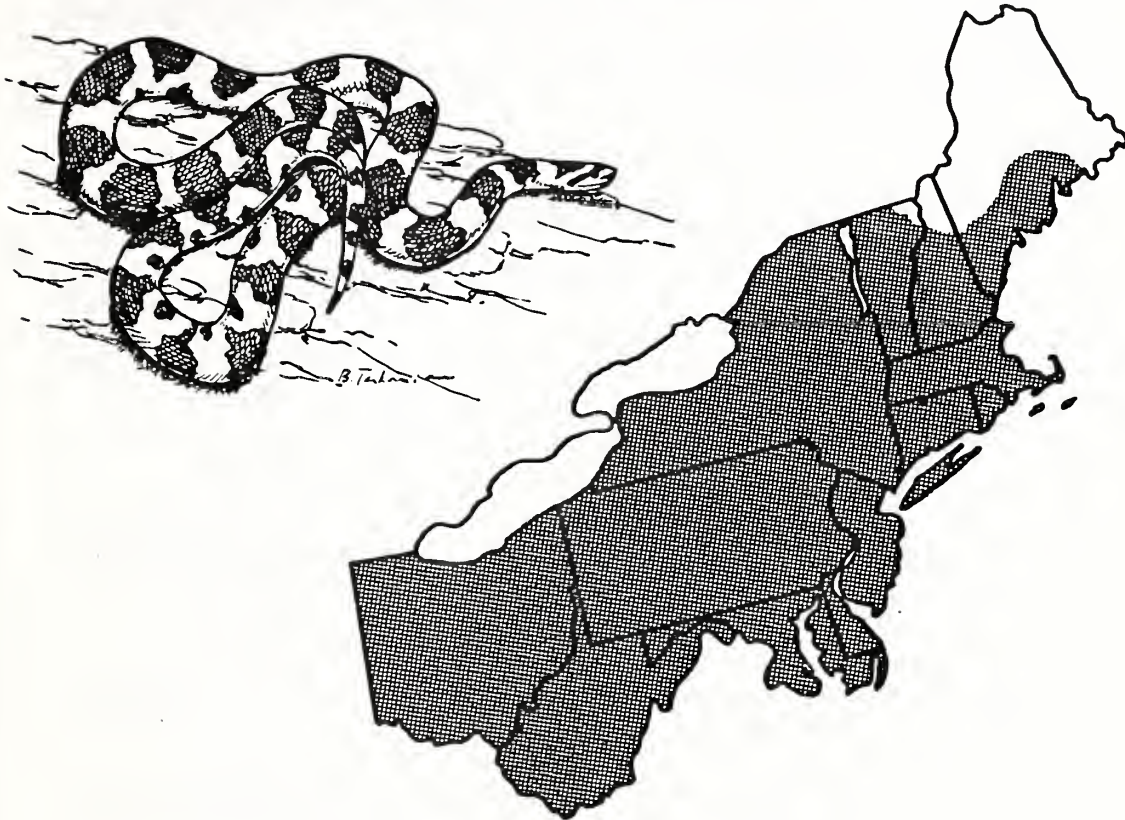
Eggs Hatch: Late August to early October.

Home Range/Movement: Average of at least 600 m in diameter for males, and at least 500 m for females in woods and fields in Maryland (Stickel et al. 1980).

Food Habits/Preferences: Small mammals comprise 60% of prey items particularly rodents, small birds and their eggs (30%), also amphibians, insects, spiders (Uhler et al. 1939). Young opossums, weasels, owls, and sparrow hawks have been captured as food (Minton 1972:273). Prey is killed by constriction.

Comments: Diurnal and arboreal.

Selected References: Schmidt and Davis 1941, Smith 1956, Wright and Wright 1957, Anderson 1965, Stickel et al. 1980.



Range: Southeastern Maine and s. Ontario to c. Minnesota, south to Tennessee and w. North Carolina and throughout the Northeast. Intergrades with the scarlet king snake in the southwestern and southeastern portion of its range.

Relative Abundance in the Northeast: Common.

Habitat in the Northeast: Various habitats, usually with brushy or woody cover, and found from sea level to mountain elevations. Usually found under cover. Farmlands, woods, outbuildings, meadows, river bottoms, bogs, rocky hillsides, rodent runways (M. Klemens, pers. commun.). Found under logs, stones, boards, well covers, stones in creek bottoms (M. Stewart, pers. commun.) or other cover during the day. In pine forests, second-growth pine, bog woods, hardwoods, aspen stands. Hibernates from October or November to April.

Special Habitat Requirements: Suitable cover or loose soil for egg laying.

Age/Size at Sexual Maturity: Third or fourth year (Fitch and Fleet 1970), males to 1,115 mm, females 404 to 966 mm (Wright and Wright 1957: 371).

Breeding Period: June (Wright and Wright 1957:371).

Egg Deposition: Mid-June to July, in piles of soil, sawdust or manure, or under other cover, often in a communal nest site.

Clutch Size: 6 to 24 eggs, typically 13.

Incubation Period: 6 to 8 weeks (Wright and Wright 1957:371).

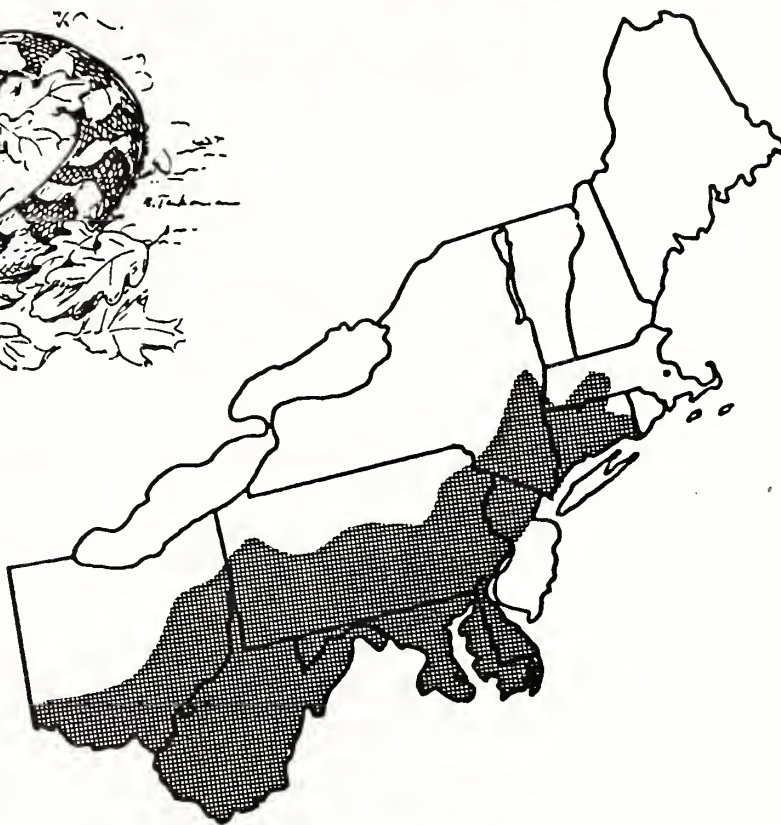
Eggs Hatch: Late August to October.

Home Range/Movement: About 50 ac (20.25 ha) for *L. triangulum sypspila*, movements of 250 to 1,300 ft (76.2 to 396.2 m) in open woodland in n.e. Kansas (Fitch and Fleet 1970). Seasonal movements probable from dryer hibernation sites to moist bottomlands for the summer (Breckenridge 1958 cited in Williams 1978:79).

Food Habits/Preferences: Mice, other small mammals, other snakes, lizards, birds and their eggs, slugs. Mice comprised 72% of the volume of stomach contents of 42 milk snakes in Pennsylvania (Surface 1908). Forages for food at night.

Comments: Typically nocturnal. Numbers may be declining as abandoned fields revert to forests (T. Tynning, pers. commun.).

Selected References: Schmidt and Davis 1941, Wright and Wright 1957, Fitch and Fleet 1970.



Range: Southwestern New England to s.w. Illinois, south to c. Georgia and through c. North Carolina.

Relative Abundance in the Northeast: Uncommon to rare.

Habitat in the Northeast: Usually associated with deciduous forests. Occupies varied habitats from swamps to mountain tops. Prefers areas with damp leaf litter (Fitch 1960a:116). Exposed mountainous, rocky hillsides, talus slopes, basalt ridges, ledges, open woods. Found in habitats with large rocks, rotting wood and sawdust piles. During summer months may be found near swamps, ponds, or streams. Largely outside of white pine-northern hardwood, and beech-maple associations (Fitch 1960a:123).

Special Habitat Requirements: Rocky hillsides, talus slopes.

Age/Size at Sexual Maturity: Males during their second summer, females at three years (Fitch 1960a:272).

Breeding Period: April to May, peak in late May. Sperm may remain viable in the female for more than a year after copulation (Allen 1955). Gestation period of 105 to 110 days (Fitch 1960a:116).

Young Born: August to September, typically September in the Northeast. Viviparous.

No. Young: 1 to 17 young, typically 5 to 6 (Wright and Wright 1957:913). Litters produced in alternate years.

Home Range/Movement: In mixed habitat of woodlands, ledges and grassland in Kansas. Fitch (1960a:147-149) recorded 24.4 ac (9.7 ha), for males and 8.5 ac (3.4 ha) for females. Seasonal movements occur between hibernaculum and lowland areas.

Food Habits/Preferences: Mice, other small rodents, insects, small birds, salamanders, lizards, small snakes, frogs, toads. Food obtained by ambush.

Comments: Nocturnal during summer months, diurnal in spring and fall. Has survived eradication in some areas due to (cryptic) coloration and retiring habits. Usually gregarious. During hibernation from October to April, sometimes found with other species of snakes including rattlesnakes. Mutually exclusive in Connecticut (Peterson 1970). Den sites are reused each year--a major limiting factor.

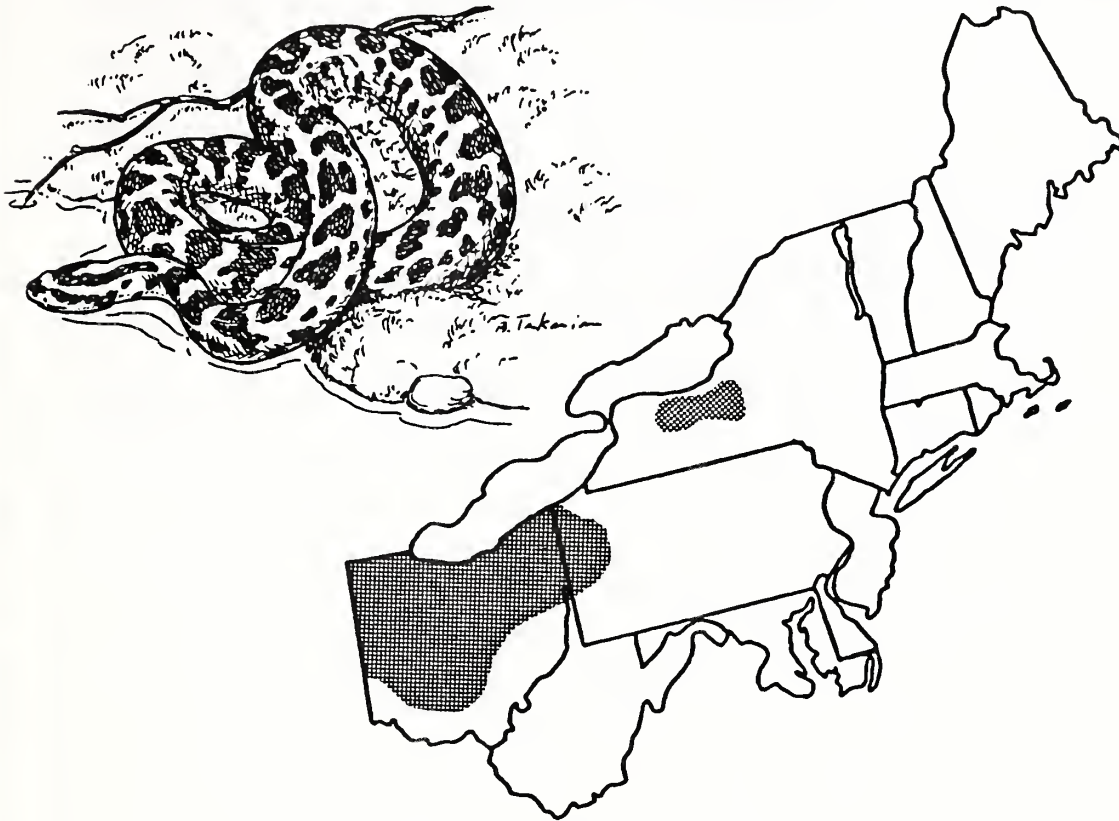
Selected References: Schmidt and Davis 1941, Smith 1956, Wright and Wright 1957, Fitch 1960, Anderson 1965.

Eastern Massasauga

Serpentes

Sistrurus c. catenatus

Viperidae



Range: Central New York, s. Ontario, s. Wisconsin to e. Iowa, Kansas, and n. Missouri to s. Indiana, Illinois and Ohio, extending into w. Pennsylvania.

Relative Abundance in the Northeast: Threatened (Federal List).

Habitat in the Northeast: Swampy areas, marshes, bogs and farmland, poorly drained areas, inundated bottomland. In summer months may move to drier areas. Hides under boards, tar paper, and other debris, in underground cavities or shocks of grain. Hibernates from November to April in wet areas.

Age/Size at Sexual Maturity: During third year (Wright 1941, Minton 1972:318).

Breeding Period: Late April, May or June. Gestation period of 15 to 16 weeks (Wright 1941).

Young Born: August to September. Viviparous.

No. Young: 2 to 14 snakes, typically 7 to 9 (Klauber 1972:733).

Home Range/Movement: Undocumented.

Food Habits/Preferences: Small terrestrial mammals, particularly mice; also frogs, small snakes, lizards, small birds. Warm-blooded prey comprised 95% of the food items of 323 individuals in Wisconsin; all food items were rodents except for 5 snakes and 1 blackbird (Keenlyne and Beer 1973).

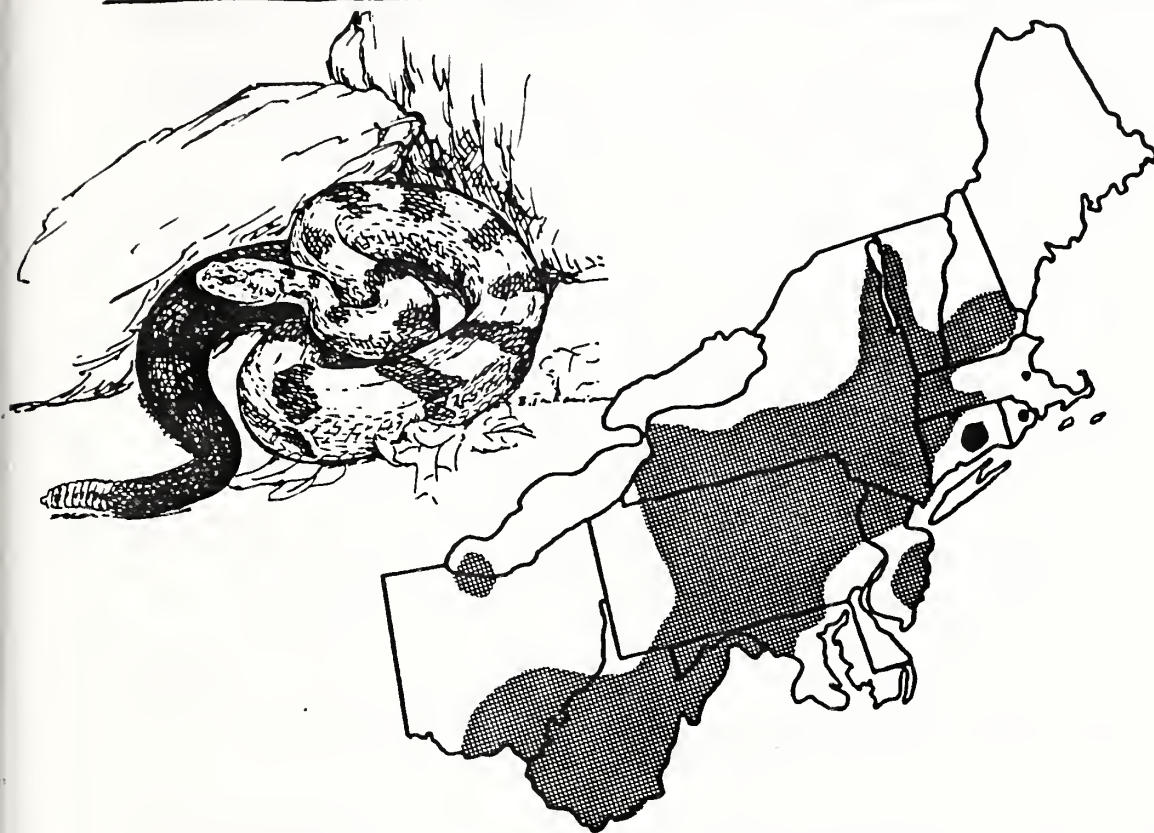
Selected References: Wright 1941, Smith 1956, Wright and Wright 1957.

Timber Rattlesnake

Crotalus horridus

Serpentes

Viperidae



Range: Southern New Hampshire, the Lake Champlain area to s.w. New York, west along the Ohio River Valley and north to the Mississippi River in Wisconsin. Extending to n. Texas, s. Illinois, n. Georgia and through the Appalachians to New Jersey.

Relative Abundance in the Northeast: Uncommon to rare.

Habitat in the Northeast: Timbered areas with rocky outcroppings, dry ridges and second growth deciduous or coniferous forests with high rodent populations. Usually southern exposures. Sometimes in swamps, quarries, old stone walls, abandoned buildings. Often found near streams in late summer. Most commonly in areas unfrequented by man, few isolated sites in existence.

Hibernates from September to April in large numbers in rocky crevices usually overgrown with brush. Found with copperheads and other snakes, due to paucity of hibernacula (T. Tying, pers. commun.).

Special Habitat Requirements: Rock outcroppings on forested hillsides.

Timber Rattlesnake

Age/Size at Sexual Maturity: Probably 3-1/2 to 4 years (Klauber 1972:335).

Breeding Period: April to May, Missouri (Anderson 1965:289), fall in Wisconsin (Messeling 1953) and Connecticut (T. Tynning, pers. commun.). Gestation period probably about 5-1/2 to 6 months.

Young Born: Late August to September, probably biennial cycles (Klauber 1972:691). Viviparous.

No. Young: 5 to 17 young, typically 7 to 10 (Klauber 1972:733).

Home Range/Movement: Females return to hibernation dens to give birth to young. Hibernation dens may be used year after year. Home ranges and favored refuges probably exist, but few investigations have been conducted (Klauber 1972:606-607).

Food Habits/Preferences: Prefers warm-blooded prey. Small mammals comprise 87% of prey taken (Uhler et al. 1939), particularly mice, but includes rabbits, shrews, chipmunks, squirrels, bats, songbirds and other snakes. Forages at night.

Comments: Extirpated from much of its former range by man; over-collection and habitat disturbance are serious threats to *Crotalus horridus* in the Northeast. Danger to humans is grossly exaggerated.

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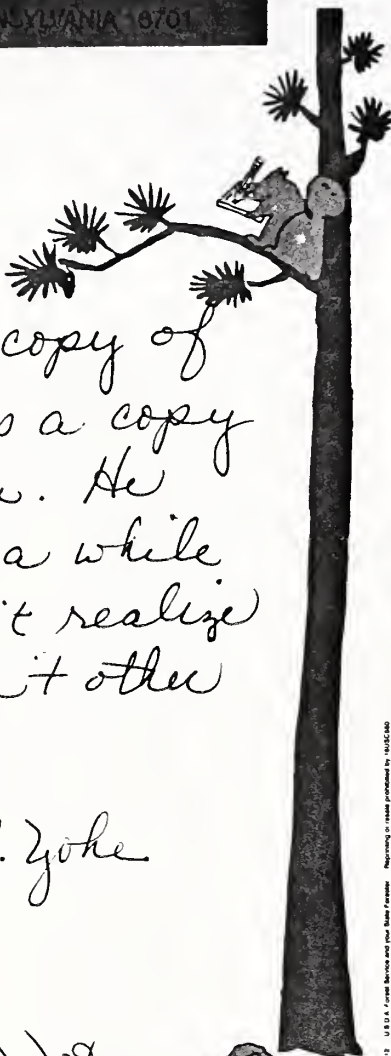
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